

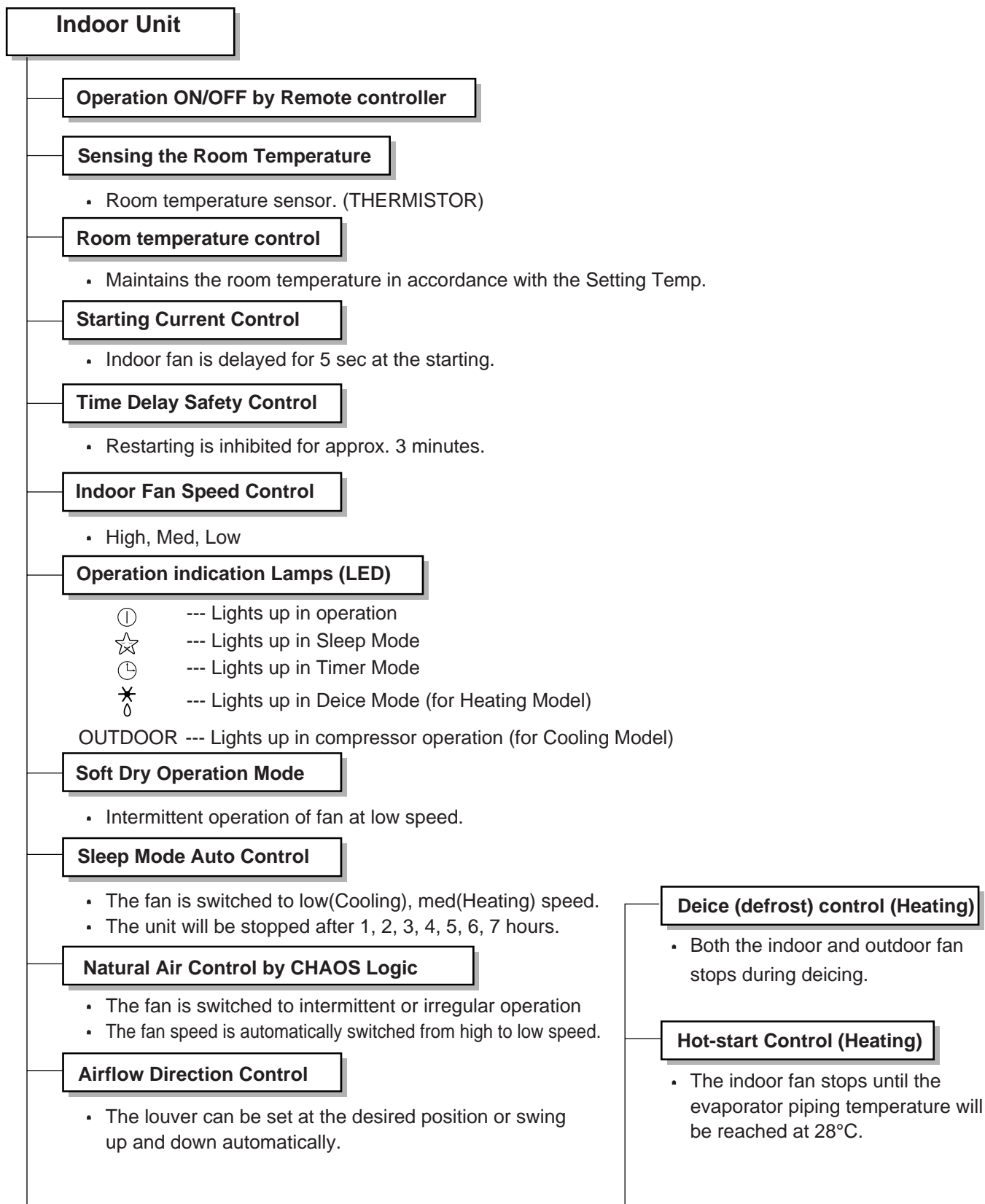
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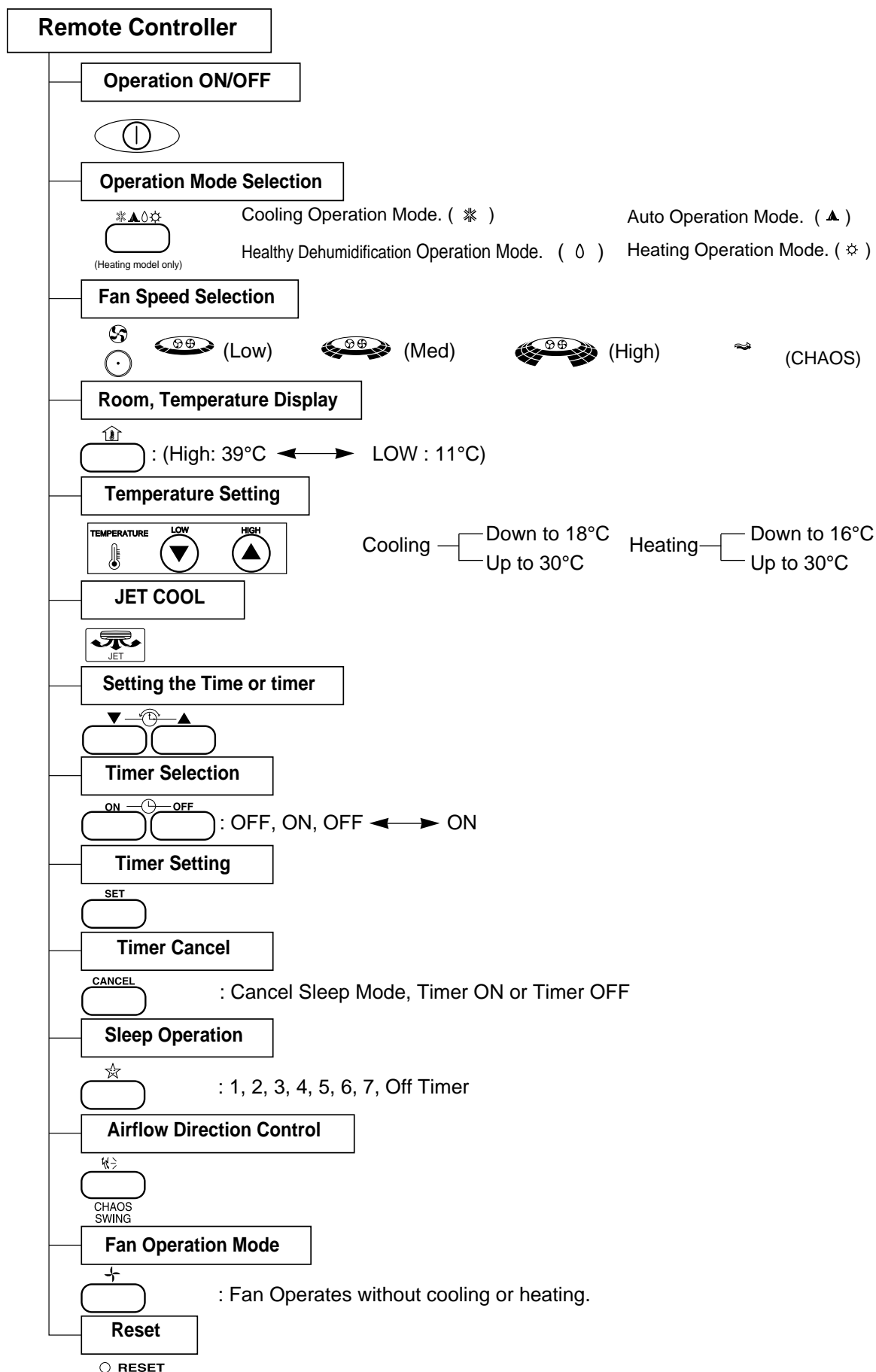
LSK1860HL

MODEL

SERVICE MANUAL

Functions





Product Specifications

Item	Unit	Model Name	LS-K1860CL/CM	LS-K1860HL/HM	LS-K1820CL/CM	LS-K1820HL/HM
Cooling Capacity	BTU/h(kcal/h)		18,000(4,536)	18,000(4,536)	18,000(4,536)	18,000(4,536)
	W		5,274	5,274	5,274	5,274
Heating Capacity	BTU/h(kcal/h)		-	19,000(4,788)	-	19,000(4,788)
	W		-	5,564	-	5,564
Moisture Removal	l/h		2.5	2.5	2.5	2.5
Power Source	Ø, V, Hz		1Ø, 220-240V, 50Hz	1Ø, 220-240V, 50Hz	1Ø, 220V, 60Hz	1Ø, 220V, 60Hz
Air Circulation	Indoor	m³/min	12	12	14	14
	Outdoor		42	42	42	42
Noise Level	Indoor	dB(A)±3	39	39	40	40
	Outdoor		53	53	51	51
Input	Cooling	W	1,900	1,950	1,900	1,800
	Heating		-	1,950	-	1,900
Runnig Current	Cooling	A	8.8	8.7	8.9	8.5
	Heating		-	8.7	-	8.9
Starting Current	Cooling	A	52	53	52	52
	Heating		-	53	-	52
E.E.R.	Cooling	BTU/h-W	9.5	9.2	9.47	10.0
C.O.P	Heating	W/W	-	2.86	-	2.93
Motor Output	Indoor	W	20	20	21	21
	Outdoor		62	62	60	60
Dimensions (W x H x D)	Indoor	mm	1,080 x 314 x 181	1,080 x 314 x 181	1,080 x 314 x 181	1,080 x 314 x 181
	Outdoor		870 x 655 x 320	870 x 655 x 320	870 x 655 x 320	870 x 655 x 320
Net. Weight	Indoor	kg	12	12	12	12
	Outdoor		57	59	57	58
Refrigerant(R-22)	g		820	1,270	870	1,360
Airflow Direction Control (Up & Down)			YES	YES	YES	YES
Airflow Direction Control (Right & Left)			NO	NO	NO	NO
Negative Ion			NO	NO	NO	NO
Air Purifying Filter			NO(OPTION)	NO(OPTION)	NO	
Deicer			NO	YES	NO	YES
Hot Start			NO	YES	NO	YES
Chaos Wind or Auto Wind			YES	YES	YES	YES
Micom Dry			YES	YES	YES	YES
Timer			24hr ON/OFF	24hr ON/OFF	24hr ON/OFF	24hr ON/OFF
Self Diagnosis			YES	YES	YES	YES
Remocon type			L.C.D Wireless	L.C.D Wireless	L.C.D Wireless	L.C.D Wireless
Service valve	Liquid		1/4"(6.35)	1/4"(6.35)	1/4"(6.35)	1/4"(6.35)
	Gas		1/2"(12.7)	1/2"(12.7)	5/8"(15.88)	5/8"(15.88)
Sleeping Operation			YES	YES	YES	YES
Drain Hose			YES	YES	YES	YES
Connecting Cable			1.5mm²	1.5, 0.75mm²	1.5mm²	1.5, 0.75mm²
Power Cord			1.5mm²	1.5mm²	1.5mm²	1.5mm²

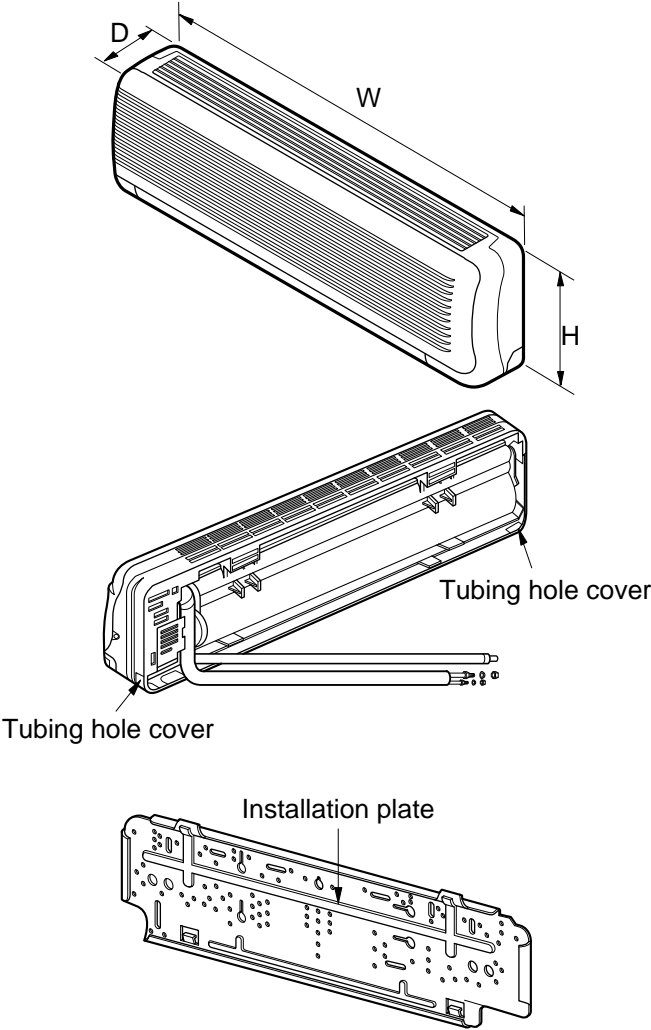
Item \ Unit		Model Name	LS-K1861CL/CM	LS-K1861HL/HM
Cooling Capacity		BTU/h(kcal/h)	18,000(4,536)	18,000(4,536)
		W	5,274	5,274
Heating Capacity		BTU/h(kcal/h)	-	19,000(4,788)
		W	-	5,564
Moisture Removal		l/h	2.5	2.5
Power Source		Ø, V, Hz	1Ø, 220-240V, 50Hz	1Ø, 220-240V, 50Hz
Air Circulation	Indoor	m³/min	12	12
	Outdoor		42	42
Noise Level	Indoor	dB(A)±3	39	39
	Outdoor		53	53
Input	Cooling	W	1,900	1,950
	Heating		-	1,950
Runnig Current	Cooling	A	8.8	8.7
	Heating		-	8.7
Starting Current	Cooling	A	52	53
	Heating		-	53
E.E.R.	Cooling	BTU/h-W	9.5	9.2
C.O.P	Heating	W/W	-	2.86
Motor Output	Indoor	W	20	20
	Outdoor		62	62
Dimensions (W x H x D)	Indoor	mm	1,080 x 314 x 181	1,080 x 314 x 181
	Outdoor		870 x 655 x 320	870 x 655 x 320
Net. Weight	Indoor	kg	12	12
	Outdoor		57	59
Refrigerant(R-22)		g	820	1,270
Airflow Direction Control (Up & Down)			YES	YES
Airflow Direction Control (Right & Left)			YES	YES
Negative Ion			YES	YES
Air Purifying Filter			YES	YES
Deicer			NO	YES
Hot Start			NO	YES
Chaos Wind or Auto Wind			YES	YES
Micom Dry			YES	YES
Timer			24hr ON/OFF	24hr ON/OFF
Self Diagnosis			YES	YES
Remocon type			L.C.D Wireless	L.C.D Wireless
Service valve	Liquid		1/4"(6.35)	1/4"(6.35)
	Gas		1/2"(12.7)	1/2"(12.7)
Sleeping Operation			YES	YES
Drain Hose			YES	YES
Connecting Cable			1.5mm²	1.5, 0.75mm²
Power Cord			1.5mm²	1.5mm²

Item	Unit	Model Name	LS-K2460CL/CM	LS-K2460HL/HM	LS-K2420CL/CM	LS-K2420HL/HM
Cooling Capacity	BTU/h(kcal/h)		24,000(6,048)	24,000(6,048)	24,000(6,048)	24,000(6,048)
	W		7,032	7,032	7,032	7,032
Heating Capacity	BTU/h(kcal/h)		-	24,000(6,040)	-	24,000(6,048)
	W		-	7,032	-	7,032
Moisture Removal	l/h		2.5	2.5	3.5	3.5
Power Source	Ø, V, Hz		1Ø, 220-240V, 50Hz	1Ø, 220-240V, 50Hz	1Ø, 220V, 60Hz	1Ø, 220V, 60Hz
Air Circulation	Indoor	m³/min	16	16	15.5	16
	Outdoor		42	42	48	48
Noise Level	Indoor	dB(A)	44	44	42±3	44±3
	Outdoor		54	54	54±3	55±3
Input	Cooling	W	2,470	2,670	2,100	2,525
	Heating		-	2,610	-	2,525
Runnig Current	Cooling	A	11.3	12.2	9.8	12.0
	Heating		-	11.9	-	12.0
Starting Current	Cooling	A	52	53	61	70
	Heating		-	53	-	70
E.E.R.	Cooling	BTU/h-W	9.7	9.0	10.5	9.5
C.O.P	Heating	W/W	-	2.635	-	2.78
Motor Output	Indoor	W	35	35	35	35
	Outdoor		83	83	78	78
Dimensions (W x H x D)	Indoor	mm	1,080 x 314x 181	1,080 x 314 x 181	1,080 x 314 x 181	1,080 x 314 x 181
	Outdoor		870 x 655 x 320	870 x 655 x 320	870 x 655 x 320	870 x 655 x 320
Net. Weight	Indoor	kg	12	12	12	12
	Outdoor		57	59	58	65
Refrigerant(R-22)	g		1,520	1,300	1,580	1,610
Airflow Direction Control (Up & Down)			YES	YES	YES	YES
Airflow Direction Control (Right & Left)			NO	NO	NO	NO
Negative Ion			NO	NO	NO	NO
Air Purifying Filter			NO(OPTION)	NO(OPTION)	NO(OPTION)	NO(OPTION)
Deicer			NO	YES	NO	YES
Hot Start			NO	YES	NO	YES
Chaos Wind or Auto Wind			YES	YES	YES	YES
Micom Dry			YES	YES	YES	YES
Timer			24hr ON/OFF	24hr ON/OFF	24hr ON/OFF	24hr ON/OFF
Self Diagnosis			YES	YES	YES	YES
Remocon type			L.C.D Wireless	L.C.D Wireless	L.C.D Wireless	L.C.D Wireless
Service valve	Liquid		3/8"(9.52)	3/8"(9.52)	1/4"(6.35)	1/4"(6.35)
	Gas		5/8"(15.88)	5/8"(15.88)	5/8"(15.88)	5/8"(15.88)
Sleeping Operation			YES	YES	YES	YES
Drain Hose			YES	YES	YES	YES
Connecting Cable			2.5mm²	2.5, 0.75mm²	2.5mm²	2.5, 0.75mm²
Power Cord			2.5mm²	2.5mm²	2.5mm²	2.5mm²

<div>Model Name</div> <div>ItemUnit</div>			LS-K2661CL/CM	LS-K2661HL/HM	LS-K2621CL/CM	LS-K2621HL/HM
Cooling Capacity		BTU/h(kcal/h)	26,000	26,000	26,000	26,000
		W	7,032	7,032	7,032	7,032
Heating Capacity		BTU/h(kcal/h)	-	24,000(6,040)	-	24,000(6,048)
		W	-	7,032	-	7,032
Moisture Removal		l/h	2.5	2.5	3.5	3.5
Power Source		Ø, V, Hz	1Ø, 220-240V, 50Hz	1Ø, 220-240V, 50Hz	1Ø, 220V, 60Hz	1Ø, 220V, 60Hz
Air Circulation	Indoor	m³/min	16	16	15.5	16
	Outdoor		42	42	48	48
Noise Level	Indoor	dB(A)	44	44	42±3	44±3
	Outdoor		54	54	54±3	55±3
Input	Cooling	W	2,470	2,670	2,100	2,525
	Heating		-	2,610	-	2,525
Runnig Current	Cooling	A	11.3	12.2	9.8	12.0
	Heating		-	11.9	-	12.0
Starting Current	Cooling	A	52	53	61	70
	Heating		-	53	-	70
E.E.R.	Cooling	BTU/h-W	9.7	9.0	10.5	9.5
C.O.P	Heating	W/W	-	2.635	-	2.78
Motor Output	Indoor	W	35	35	35	35
	Outdoor		83	83	78	78
Dimensions (W x H x D)	Indoor	mm	1,080 x 314 x 181	1,080 x 314 x 181	1,080 x 314 x 181	1,080 x 314 x 181
	Outdoor		870 x 655 x 320	870 x 655 x 320	870 x 655 x 320	870 x 655 x 320
Net. Weight	Indoor	kg	12	12	12	12
	Outdoor		57	59	58	65
Refrigerant(R-22)		g	1,520	1,300	1,580	1,610
Airflow Direction Control (Up & Down)			YES	YES	YES	YES
Airflow Direction Control (Right & Left)			YES	YES	YES	YES
Negative Ion			YES	YES	YES	YES
Air Purifying Filter			YES	YES	YES	YES
Deicer			NO	YES	NO	YES
Hot Start			NO	YES	NO	YES
Chaos Wind or Auto Wind			YES	YES	YES	YES
Micom Dry			YES	YES	YES	YES
Timer			24hr ON/OFF	24hr ON/OFF	24hr ON/OFF	24hr ON/OFF
Self Diagnosis			YES	YES	YES	YES
Remocon type			L.C.D Wireless	L.C.D Wireless	L.C.D Wireless	L.C.D Wireless
Service valve		Liquid	3/8"(9.52)	3/8"(9.52)	1/4"(6.35)	1/4"(6.35)
		Gas	5/8"(15.88)	5/8"(15.88)	5/8"(15.88)	5/8"(15.88)
Sleeping Operation			YES	YES	YES	YES
Drain Hose			YES	YES	YES	YES
Connecting Cable			2.5mm²	2.5, 0.75mm²	2.5mm²	2.5, 0.75mm²
Power Cord			2.5mm²	2.5mm²	2.5mm²	2.5mm²

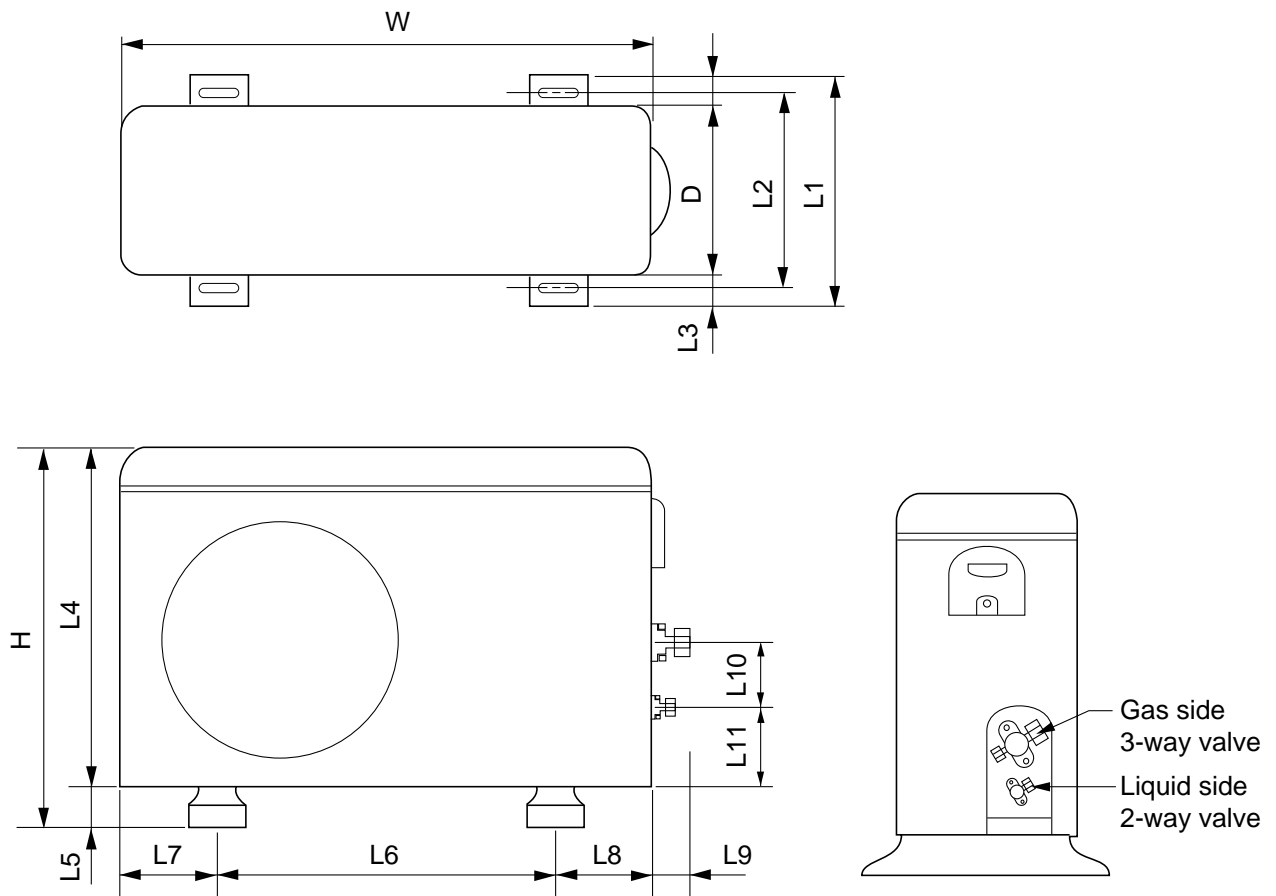
Dimensions

(1) Indoor Unit



MODEL		ALL MODELS
DIMENSION		
W	mm	1,080
H	mm	314
D	mm	181

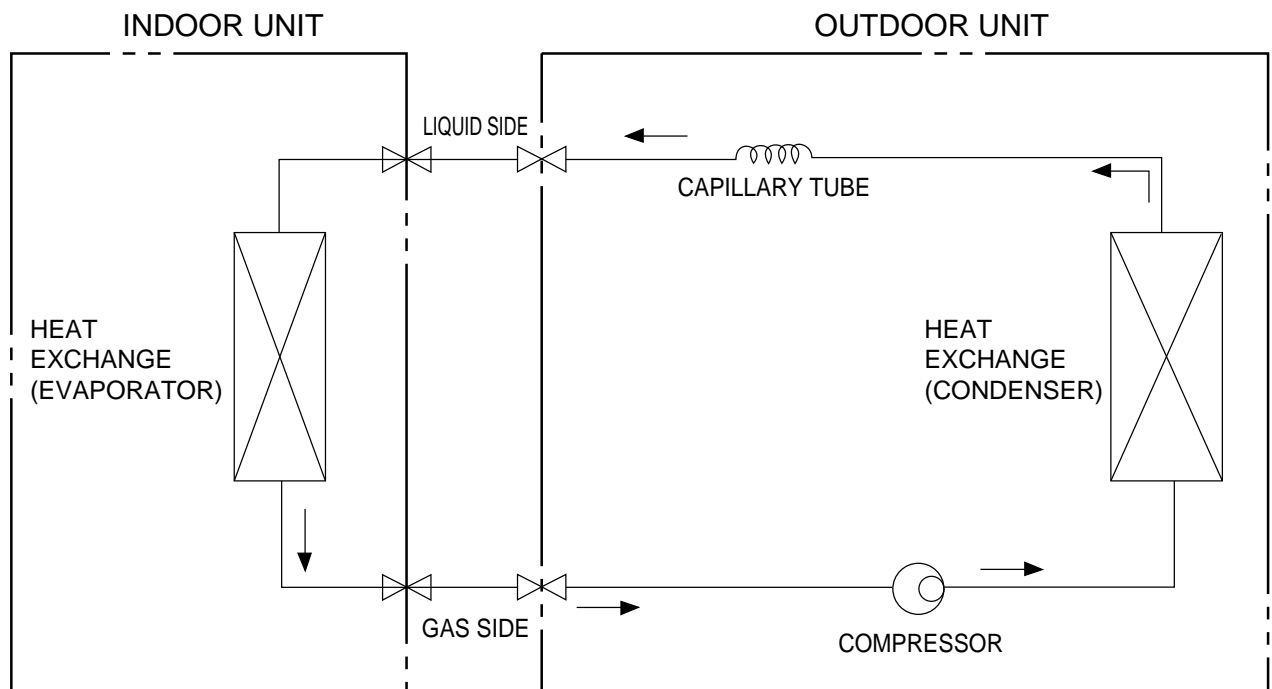
(2) Outdoor Unit



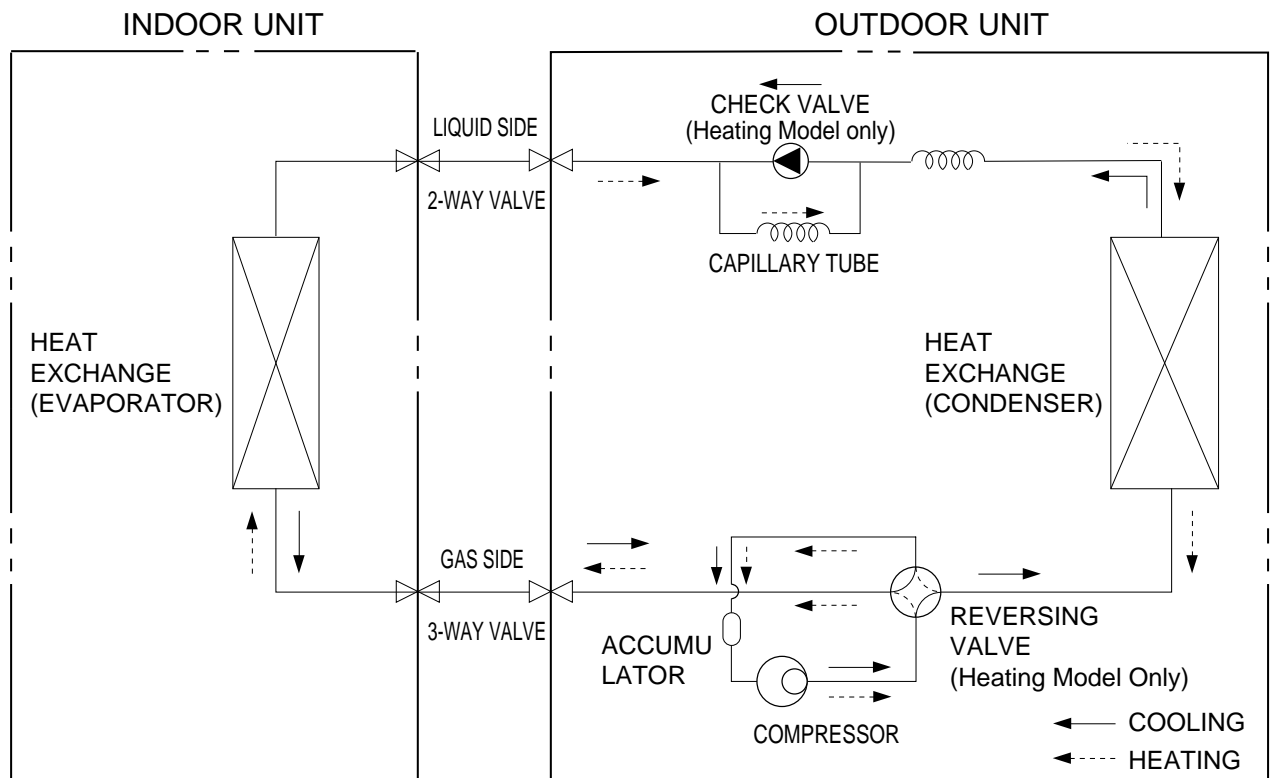
MODEL		ALL MODELS
DIM		
W	mm	870
H	mm	655
D	mm	320
L1	mm	370
L2	mm	340
L3	mm	25
L4	mm	630
L5	mm	25
L6	mm	546
L7	mm	162
L8	mm	162
L9	mm	54
L10	mm	74.5
L11	mm	79

Refrigeration Cycle Diagram

(1) Cooling Only Models

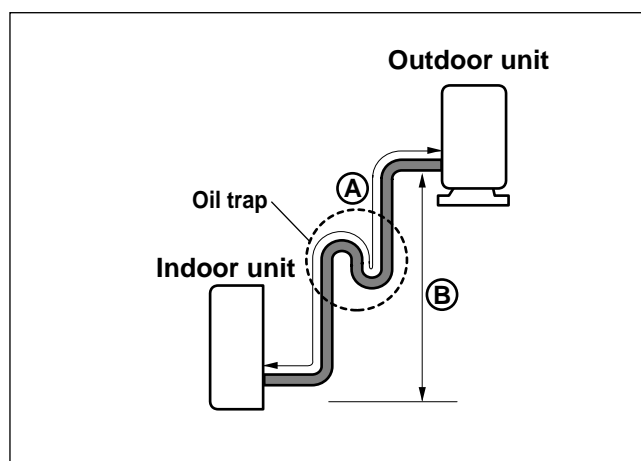
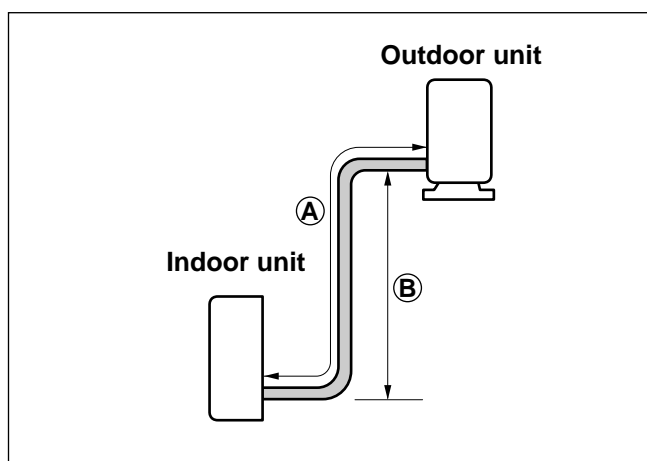


(2) Cooling & Heating Models



Pipe length and the elevation

Capacity (Btu/h)	Pipe Size		Standard Length (m)	Max. Elevation Ⓑ (m)	Max. Length Ⓐ (m)	Additional Refrigerant (g/m)
	GAS	LIQUID				
18K(60Hz)	5/8"	1/4"	4 or 5	10	20	20
18K(50Hz)	1/2"	1/4"	4 or 5	15	30	30
24K(60Hz)	5/8"	1/4"	4 or 5	15	30	30
24K(50Hz)	5/8"	3/8"	4 or 5	15	30	30



In case more than 5m

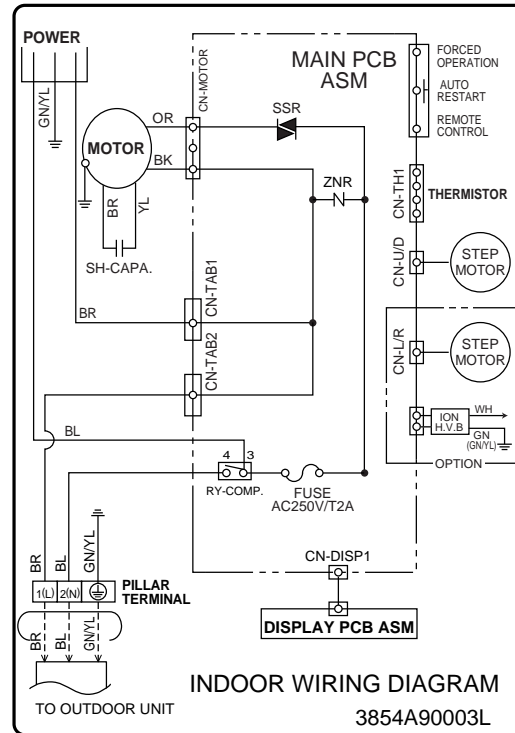
CAUTION

- * Capacity is based on standard length and maximum allowance length is the basis of reliability.
- * **Oil trap should be installed per 5~7 meters.**
- * Numerical value in "()" is for Rotary Comp. model.

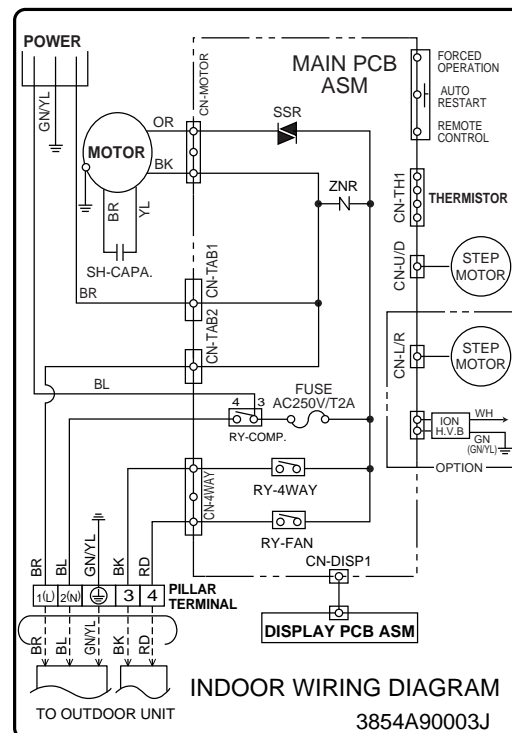
Wiring Diagram

(1) Indoor Unit

1. LS-K1820/1860/1861/2420/2460/2621/2661CL/CM

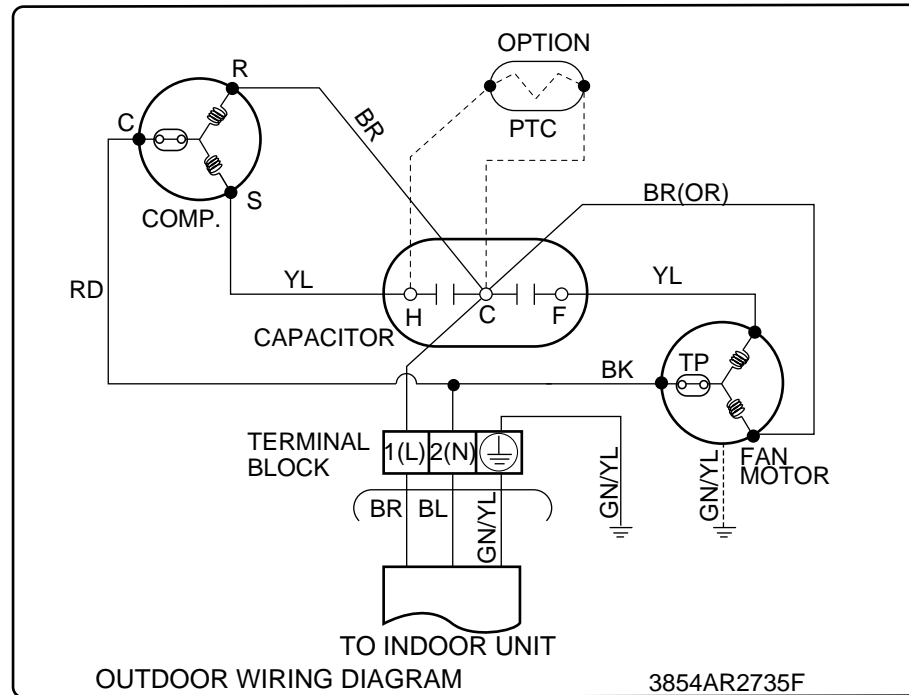


2. LS-K1820/1860/1861/2420/2460/2621/2661HL/HM

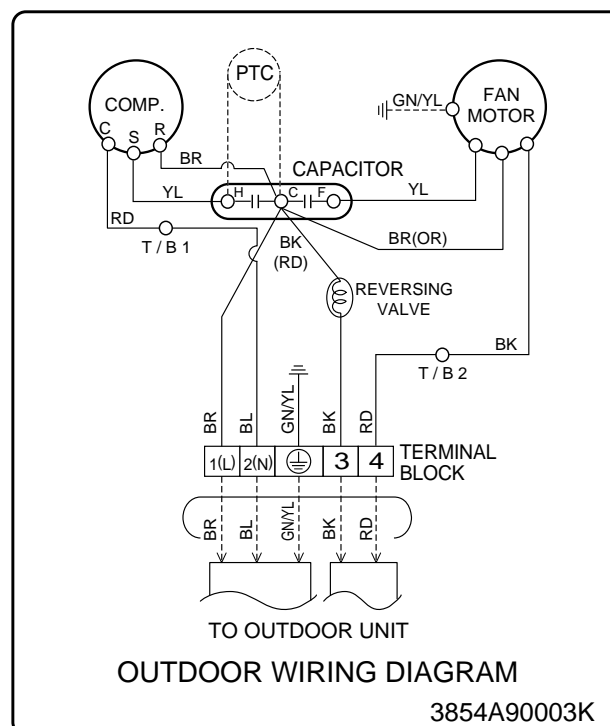


(2) Outdoor Unit

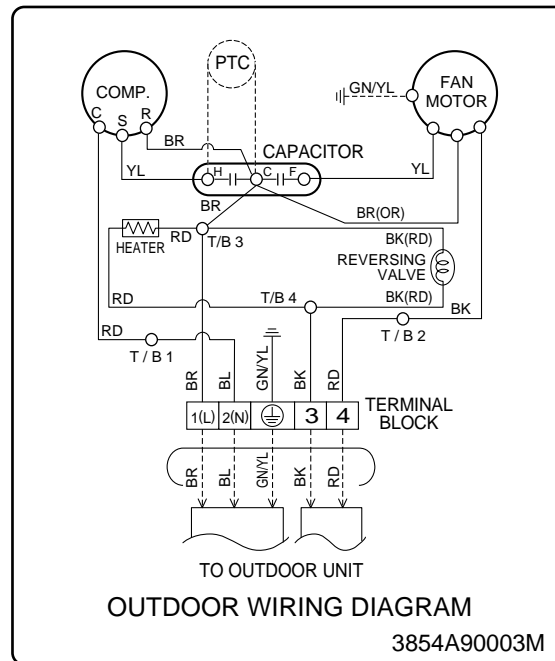
1. LS-K1820/1860/1861/2420/2460/2621/2661CL/CM



2. LS-K1820/HL/HM



3. LS-K1860/1861/2420/2460/2621/2661HL/HM



Operation Details

1. MAIN UNIT FUNCTION

• DISPLAY

1) Standard Model (simple LCD remote controller supplied)

Cooling Indicator

- On while in cooling mode operation, off while in dehumidification operation or appliance operation pause
- Flashing while in disconnection or short in Thermistor (3 sec off / 0.5 sec on)

Dehumidification Indicator

- On while in dehumidification operation, off while in cooling mode operation or appliance operation pause

Timer Indicator

- On while in off timer mode, off while in timer off or appliance operation pause

Comp. Running Indicator

- While in appliance operation, on while in outdoor unit compressor running, off while in compressor off

2) C/O Model (high quality LCD remote controller supplied)

Operation Indicator

- On while in appliance operation, off while in appliance pause
- Flashing while in disconnection or short in Thermistor (3 sec off / 0.5 sec on)

Sleep Timer Indicator

- On while in sleep timer mode, off when sleep timer cancel or appliance operation pause

Timer Indicator

- On while in timer mode (on/off), off when timer mode is completed or canceled

Comp. Running Indicator

- While in appliance operation, on while in outdoor unit compressor running, off while in compressor off

3) H/P Model (high quality LCD remote controller supplied)

Operation Indicator

- On while in appliance operation, off while in appliance pause
- Flashing while in disconnection or short in Thermistor (3 sec off / 0.5 sec on)

Sleep Timer Indicator

- On while in sleep timer mode, off when sleep timer cancel or appliance operation pause

Timer Indicator

- On while in timer mode (on/off), off when timer mode is completed or canceled

Defrost Indicator

- Off except when hot start during heating mode operation or while in defrost control

■Cooling Mode Operation

- When the intake air temperature reaches 0.5°C below the setting temp, the compressor and the outdoor fan stop.
- When it reaches 0.5°C above the setting temp, they start to operate again.
Compressor ON Temp=> Setting Temp+0.5°C
Compressor OFF Temp => Setting Temp-0.5°C
- While in compressor running, operating with the airflow speed set by the remote controller. While in compressor not running, operating with the low airflow speed regardless of the setting.

■ Healthy Dehumidification Mode

- When the dehumidification operation input by the remote controller is received, the intake air temperature is detected and the setting temp is automatically set according to the intake air temperature.
 $26^{\circ}\text{C} \leq \text{Intake Air Temp} \Rightarrow 25^{\circ}\text{C}$
 $24^{\circ}\text{C} \leq \text{Intake Air Temp} < 26^{\circ}\text{C} \Rightarrow \text{Intake Air Temp} - 1^{\circ}\text{C}$
 $18^{\circ}\text{C} \leq \text{Intake Air Temp} < 24^{\circ}\text{C} \Rightarrow \text{Intake Air Temp} - 0.5^{\circ}\text{C}$
 $\text{Intake Air Temp} < 18^{\circ} \Rightarrow 18^{\circ}\text{C}$
- While in compressor off, the indoor fan repeats low airflow speed and pause.
- While the intake air temp is between compressor on temp. and compressor off temp., 10-min dehumidification operation and 4-min compressor off repeat
Compressor ON Temp. \Rightarrow Setting Temp + 0.5°C
Compressor OFF Temp. \Rightarrow Setting Temp - 0.5°C
- In 10-min dehumidification operation, the indoor fan operates with the low airflow speed.

■ Heating Mode Operation

- When the intake air temp reaches +3°C above the setting temp, the compressor is turned off. When below the setting temp, the compressor is turned on.
Compressor ON Temp. \Rightarrow Setting Temp.
Compressor OFF Temp. \Rightarrow Setting Temp. + 3°C
- While in compressor on, the indoor fan is off when the indoor pipe temp. is below 26°C, when above 28°C, it operates with the low or setting airflow speed (while in sleep mode, with the medium airflow speed).
- While in compressor off, the indoor fan is off when the indoor pipe temp is below 33°C, when above 35°C, it operates with the low airflow speed.
- If overloaded while in heating mode operation, in order to prevent the compressor from OLP operation, the outdoor fan is turned on/off according to the indoor pipe temp.
- While in defrost control, both of the indoor and outdoor fans are turned off.

■ Defrost Control (New Type Defrost Control)

- While in heating mode operation in order to protect the evaporator pipe of the outdoor unit from freezing, reversed to cooling cycle to defrost the evaporator pipe of the outdoor unit.
- Defrost control is available 60 min. later since heating mode operation started, and it will not prolong over 12 min.
- Defrost control is carried out according to the following priority order while in heating mode operation.
1st priority : Defrost control is carried out according to the indoor pipe temp 60 min. later since heating mode operation started.
2nd priority : The temp differences between the indoor pipe temp and the intake air temp 25 min. later ($\Delta T1$) and 60 min. later ($\Delta T2$) since heating mode operation started are measured, then defrost control is carried out according to the difference ($\Delta T = \Delta T1 - \Delta T2$).
3rd priority : Defrost control is carried out according to the temp difference ($\Delta TE = TE1 - TE2$) between the indoor pipe temperatures of 25 min later ($TE1$) and 60 min later ($TE2$) after heating mode operation started.
- When the indoor pipe temp is 41°C or above, defrost control is not carried out even if the condition is one of the defrost conditions above.
- While in defrost control, the compressor is on and the indoor fan, the outdoor fan, and the 4 way valve are off.

■ Defrost Control (Fuzzy Rule applied)

- While in heating mode operation in order to protect the evaporator pipe of the outdoor unit from freezing, reversed to cooling cycle to defrost the evaporator pipe of the outdoor unit.
- After 40 min heating mode operation, at 4 min interval, whether to carry out defrost control or not and the time of defrost control are determined according to the following conditions.
 - 1) While in heating mode operation, the maximum of the indoor pipe temperature is measured and it is compared with the present indoor pipe temperature to get the difference of the indoor pipe temperatures (=the maximum temperature of indoor pipe - the present temperature of indoor pipe), according to which, whether to carry out defrost control or not is determined.
 - 2) According to the need of defrost control shown above and the elapsed time of heating mode operation at that moment, the defrost control time is determined.
 - 3) When the determined time of defrost control is below 7 min, heating mode operation continues without carrying out defrost control. According to the procedure stated above, the determination is made again. When the defrost control time is 7 min or longer, defrost control is then carried out.
- While in defrost control, the minimum temp of the indoor pipe is measured and it is compared with the present temp of the indoor pipe to get the difference of the indoor pipe temperatures (=the present temperature of the indoor pipe - the minimum temperature of the indoor pipe). When the difference is 5°C or higher, defrost control is completed and heating mode operation is carried out.
- While in defrost control, if the defrost time determined before the start of defrost control is completed, defrost control stops and heating mode operation is carried out regardless of the above condition.
- When the indoor pipe temp is 42°C or above, defrost control is not carried out even if the condition is one of the defrost conditions above.
- While in defrost control, the compressor is on and the indoor fan, the outdoor fan, and the 4 way valve are off.

■ Fuzzy Operation (C/O Model)

- According to the temperature set by Fuzzy rule, when the intake air temp is 0.5°C or more below the setting temp, the compressor is turned off. When 0.5°C or more above the setting temp, the compressor is turned on.
Compressor ON Temp => Setting Temp+0.5°C
Compressor OFF Temp => Setting Temp-0.5°C
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temp at that time.
 $26^{\circ}\text{C} \leq \text{Intake Air Temp} \Rightarrow 25^{\circ}\text{C}$
 $24^{\circ}\text{C} \leq \text{Intake Air Temp} < 26^{\circ}\text{C} \Rightarrow \text{Intake Air Temp} + 1^{\circ}\text{C}$
 $22^{\circ}\text{C} \leq \text{Intake Air Temp} < 24^{\circ}\text{C} \Rightarrow \text{Intake Air Temp} + 0.5^{\circ}\text{C}$
 $18^{\circ}\text{C} \leq \text{Intake Air Temp} < 22^{\circ}\text{C} \Rightarrow \text{Intake Air Temp}$
 $\text{Intake Air Temp} < 18^{\circ}\text{C} \Rightarrow 18^{\circ}\text{C}$
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan is automatically selected according to the temperature

■ Fuzzy Operation (H/P Model)

- When any of operation mode is not selected like the moment of the power on or when 3 hrs has passed since the operation off, the operation mode is selected.

-
- When determining the operation mode, the compressor, the outdoor fan, and the 4 way valve are off and only the indoor fan is operated for 15 seconds. Then an operation mode is selected according to the intake air temp at that moment as follows.
 - $24^{\circ}\text{C} \leq \text{Intake Air Temp} \Rightarrow \text{Fuzzy Operation for Cooling}$
 - $21^{\circ}\text{C} \leq \text{Intake Air Temp} < 24^{\circ}\text{C} \Rightarrow \text{Fuzzy Operation for Dehumidification}$
 - $\text{Intake Air Temp} < 21^{\circ}\text{C} \Rightarrow \text{Fuzzy Operation for Heating}$
 - If any of the operation modes among cooling / dehumidification / heating mode operations is carried out for 10 sec or longer before Fuzzy operation, the mode before Fuzzy operation is operated.

1) Fuzzy Operation for Cooling

- According to the setting temperature selected by Fuzzy rule, when the intake air temp is 0.5°C or more below the setting temp, the compressor is turned off. When 0.5°C or more above the setting temp, the compressor is turned on.
 - Compressor ON Temp $\Rightarrow \text{Setting Temp} + 0.5^{\circ}\text{C}$
 - Compressor OFF Temp $\Rightarrow \text{Setting Temp} + 0.5^{\circ}\text{C}$
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temp at that time.
 - $26^{\circ}\text{C} \leq \text{Intake Air Temp} \Rightarrow 25^{\circ}\text{C}$
 - $24^{\circ}\text{C} \leq \text{Intake Air Temp} < 26^{\circ}\text{C} \Rightarrow \text{Intake Air Temp} + 1^{\circ}\text{C}$
 - $22^{\circ}\text{C} \leq \text{Intake Air Temp} < 24^{\circ}\text{C} \Rightarrow \text{Intake Air Temp} + 0.5^{\circ}\text{C}$
 - $18^{\circ}\text{C} \leq \text{Intake Air Temp} < 22^{\circ}\text{C} \Rightarrow \text{Intake Air Temp}$
 - $\text{Intake Air Temp} < 18^{\circ}\text{C} \Rightarrow 18^{\circ}\text{C}$
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan is automatically selected according to the temperature.

2) Fuzzy Operation for Dehumidification

- According to the setting temperature selected by Fuzzy rule, when the intake air temp is 0.5°C or more below the setting temp, the compressor is turned off. When 0.5°C or more above the setting temp, the compressor is turned on.
 - Compressor ON Temp $\Rightarrow \text{Setting Temp} + 0.5^{\circ}\text{C}$
 - Compressor OFF Temp $\Rightarrow \text{Setting Temp} + 0.5^{\circ}\text{C}$
- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temp at that time.
 - $26^{\circ}\text{C} \leq \text{Intake Air Temp} \Rightarrow 25^{\circ}\text{C}$
 - $24^{\circ}\text{C} \leq \text{Intake Air Temp} < 26^{\circ}\text{C} \Rightarrow \text{Intake Air Temp} + 1^{\circ}\text{C}$
 - $22^{\circ}\text{C} \leq \text{Intake Air Temp} < 24^{\circ}\text{C} \Rightarrow \text{Intake Air Temp} + 0.5^{\circ}\text{C}$
 - $18^{\circ}\text{C} \leq \text{Intake Air Temp} < 22^{\circ}\text{C} \Rightarrow \text{Intake Air Temp}$
 - $\text{Intake Air Temp} < 18^{\circ}\text{C} \Rightarrow 18^{\circ}\text{C}$
- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan repeats the low airflow speed or pause as in dehumidification operation.

3) Fuzzy Operation for Heating

- According to the setting temperature selected by Fuzzy rule, when the intake air temp is 3°C or more above the setting temp, the compressor is turned off. When below the setting temp, the compressor is turned on.

Compressor ON Temp => Setting Temp

Compressor OFF Temp => Setting Temp + 3°C

- At the beginning of Fuzzy mode operation, the setting temperature is automatically selected according to the intake air temp at that time.

20°C ≤ Intake Air Temp => Intake Air Temp + 0.5°C

Intake Air Temp < 20°C => 20°C

- When the Fuzzy key (Temperature Control key) is input after the initial setting temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the setting temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan is set to the high or the medium according to the intake air temperature and the setting temperature.

■ Airflow Speed Selection

- The airflow speed of the indoor fan is set to high, medium, low, or chaos (auto) by the input of the airflow speed selection key on the remote controller.

■ On-Timer Operation

- When the set time is reached after the time is input by the remote controller, the appliance starts to operate.
- The timer LED is on when the on-timer is input. It is off when the time set by the timer is reached.
- If the appliance is operating at the time set by the timer, the operation continues.

■ Off-Timer Operation

- When the set time is reached after the time is input by the remote controller, the appliance stops operating.
- The timer LED is on when the off-timer is input. It is off when the time set by the timer is reached.
- If the appliance is on pause at the time set by the timer, the pause continues.

■ Off-Timer <=> On-Timer Operation

- When the set time is reached after the on/off time is input by the remote controller, the on/off-timer operation is carried out according to the set time.

■ Off-Timer Operation (Simple LCD Remote Controller)

- When the set time is reached after <1,2,3,4,5,6,7,0(cancel) hr> is input by the remote controller while in appliance operation, the operation of the appliance stops.
- If the operation of the appliance is stopped while in the off-timer mode, the off-timer mode is canceled.
- The timer LED is on when the off-timer mode is input. When the off-timer mode is canceled, it is off."

■ Sleep Timer Operation

- When the sleep time is reached after <1,2,3,4,5,6,7,0(cancel) hr> is input by the remote controller while in appliance operation, the operation of the appliance stops.
- While the appliance is on pause, the sleep timer mode cannot be input.

-
- While in cooling mode operation, 30 min later since the start of the sleep timer, the setting temperature increases by 1°C. After another 30 min elapse, it increases by 1°C again.
 - When the sleep timer mode is input while in cooling cycle mode, the airflow speed of the indoor fan is set to the low.
 - When the sleep timer mode is input while in heating cycle mode, the airflow speed of the indoor fan is set to the medium.

■ Chaos Swing Mode

- By the Chaos Swing key input, the upper/lower vane automatically operates with the Chaos Swing or they are fixed to the desired direction.
- While in Chaos Swing mode, the angles of cooling and heating cycle operations are different.

■ Chaos Natural Wind Mode

- When the Chaos Natural Wind mode is selected and then operated, the high, medium, or low speed of the airflow mode is operated for 2~15 sec randomly by the Chaos Simulation."

■ Jet Cool Mode Operation (C/O Model)

- If the Jet Cool key is input at any operation mode while in appliance operation, the Jet Cool mode operates.
- In the Jet Cool mode, the indoor fan is operated at super-high speed for 30 min at cooling mode operation.
- In the Jet Cool mode operation, the room temperature is controlled to the setting temperature, 18°C
- When the sleep timer mode is input while in the Jet Cool mode operation, the Jet Cool mode has the priority.
- When the Jet Cool key is input, the upper/lower vanes are reset to those of the initial cooling mode and then operated in order that the air outflow could reach further.

■ Jet Cool Mode Operation (H/P Model)

- While in heating mode or Fuzzy operation, the Jet Cool key cannot be input. When it is input while in the other mode operation (cooling, dehumidification, ventilation), the Jet Cool mode is operated."
- In the Jet Cool mode, the indoor fan is operated at super-high speed for 30 min at cooling mode operation.
- In the Jet Cool mode operation, the room temperature is controlled to the setting temperature, 18°C
- When the sleep timer mode is input while in the Jet Cool mode operation, the Jet Cool mode has the priority.
- When the Jet Cool key is input, the upper/lower vanes are reset to those of the initial cooling mode and then operated in order that the air outflow could reach further.

■ Auto Restarting Operation

- When the power is restored after a sudden power failure while in appliance operation, the mode before the power failure is kept on the memory and the appliance automatically operates in the mode on the memory.
- The slide switch on the main unit of the appliance should be on the Auto Restarting position in order that the Auto Restarting operation is available.
- Operation Mode that is kept on the memory
 - State of Operation ON/OFF
 - Operation Mode/Setting Temp/Selected Airflow Speed
 - Sleep Timer Mode/Remaining Time of Sleep Timer (unit of hour)
- If no input by the remote controller or no switching of the slide switch within 7 hr after the appliance operates by the Auto Restarting operation, the appliance is forced to stop at the moment of 7-hr elapse.

■ Forced Operation (C/O Model)

- To operate the appliance by force in case that the remote controller is lost, the forced operation selection switch is on the main unit of the appliance to operate the appliance in the standard conditions.
- When the power is supplied while the slide switch is on the forced operation position, or when the slide switch position is switched to the Auto Restarting position (or test operation) or switched from the remote control position to the forced operation position while the power is on, the forced operation is carried out.
- When the slide switch position is switched from the forced operation position to the Auto Restarting position or the remote control position, the forced operation is canceled and the appliance stops operating.
- The forced operation is carried out in cooling mode with the setting temperature 22°C and the high speed of air-flow.
- While in forced operation, the key input by the remote controller has no effect and the buzzer sounds 10 times to indicate the forced operation.

■ Forced Operation (H/P Model)

- To operate the appliance by force in case that the remote controller is lost, the forced operation selection switch is on the main unit of the appliance to operate the appliance in the standard conditions.
- When the power is supplied while the slide switch is on the forced operation position, or when the slide switch position is switched to the Auto Restarting (or test operation) position or switched from the remote control position to the forced operation position while the power is on, the forced operation is carried out.
- When the slide switch position is switched from the forced operation position to the Auto Restarting position or the remote control position, the forced operation is canceled and the appliance stops operating.
- The forced operation is carried out in cooling mode with the setting temperature 22°C and the high speed of air-flow.
- In the forced operation mode, the indoor fan is operated at low speed for around 15 sec and then the operation condition is set according to the intake air temperature as follows.
24°C ≤ Intake Air Temp => Cooling Mode Operation, 22°C, High Speed
21°C ≤ Intake Air Temp < 24°C => Dehumidification Operation, 23°C, High Speed
Intake Air Temp < 21°C => Heating Mode Operation, 24°C, High Speed
- While in forced operation, the key input by the remote controller has no effect and the buzzer sounds 10 times to indicate the forced operation.

■ Test Operation Control

- To check the condition of the installation when installing the appliance, the appliance is operated at cooling mode, high speed of airflow, compressor-on for 18 min without controlling the room temperature.
- Only when the slide switch on the main unit is switched from the remote control position to the test operation position, test operation is carried out.
- When the slide switch position is switched to the remote control position while in test operation, the test operation is canceled and the appliance is stopped. When switched to the forced operation position, the test operation is canceled and the forced operation is carried out.
- While in test operation, a key can be input by the remote controller.
When a key (operation start/stop, operation mode selection, airflow speed selection, temperature control, Jet Cool) is input by the remote controller, the test operation is canceled and the appliance is operated according to the setting by the remote controller.

■ Remote Control Operation Mode

- When the remote control is selected by the slide switch on the main unit, the appliance operates according to the input by the remote controller.

■ Protection of the evaporator pipe from frosting

- If the indoor pipe temp is below 0°C in 7 min after the compressor operates without any pause while in cooling cycle operation mode, the compressor and the outdoor fan are turned off in order to protect the indoor evaporator pipe from frosting.
- When the indoor pipe temp is 7°C or higher after 3 min pause of the compressor, the compressor and the outdoor fan is turned on according to the condition of the room temperature.

■ Buzzer Sounding Operation

- When the appliance-operation key is input by the remote controller, the short “beep-beep-” sounds.
- When the appliance-pause key is input by the remote controller, the long “beep—” sounds.
- When a key is input by the remote controller while the slide switch on the main unit of the appliance is on the forced operation position, the error sound “beep-beep-beep-beep-beep-” is made 10 times to indicate that the remote control signal cannot be received.

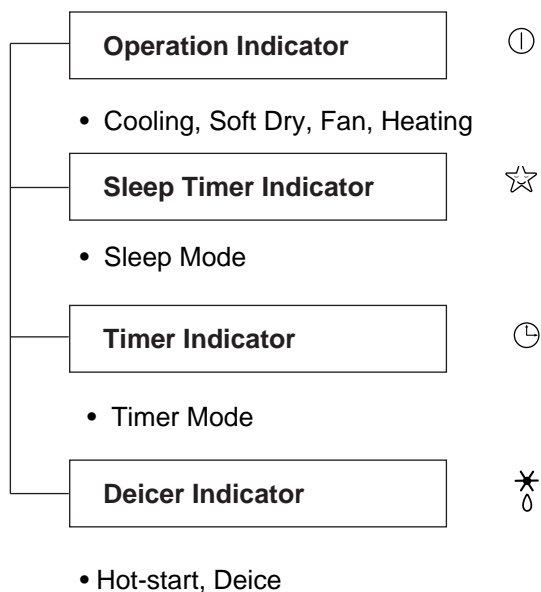
■ Self Diagnosis Operation

Thermistor Error Indicator

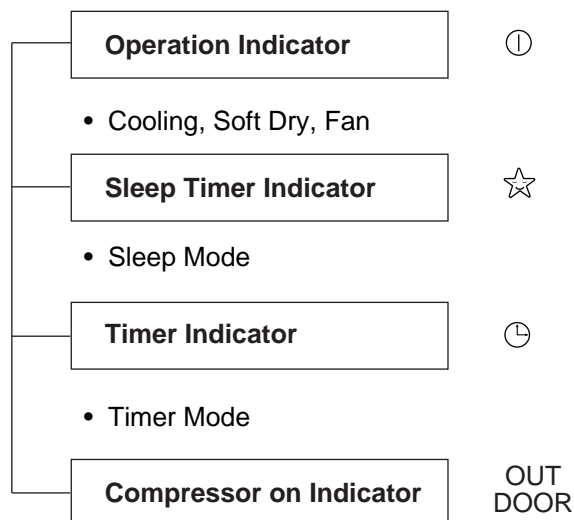
- When the indoor pipe sensor or the room temperature sensor is open or is shorted, the error is indicated.
 - To indicate the error, the operation LED (or the cooling LED) flashed at 3 sec interval.
 - When the error is cleared, the LED stops flashing, the operation (or cooling) LED is on.
 - While in appliance pause, the error is not indicated.
-
- Since the airflow quantity and speed are controlled by the adjustment of the vane angle using the Wind-up effect, you can enjoy the natural and pleasant wind uniformly at any location in the room.
 - Since the indoor outflow air is sucked again by the upper/lower vanes, the indoor temperature drop is minimized and the pleasant humidity is maintained.

Display Function

1. Heating Model



2. Cooling Model



Self-diagnosis Function

■ Thermistor Cut Off or Short

Cut Off/Short : Blinks on and off the operation mode LED. (0.5 sec ON/3 sec OFF)

■ Protection of the evaporator pipe from frosting

If the temperature of the indoor pipe is below 0°C after 7 minutes from starting the compressor, the compressor and outdoor fan is stopped, and then after 3 minutes delay of operating of the compressor, when the temperature of the indoor pipe is over 7°C, the compressor and the outdoor fan is reoperated.

Installation

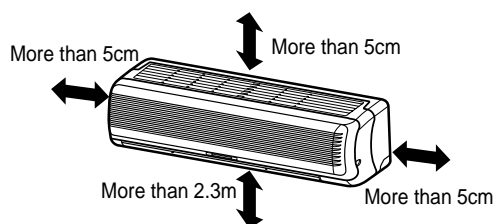
Read completely, then follow step by step.

1. Installation of Indoor, Outdoor unit

1) Select the best location

1. Indoor unit

- Do not have any heat or steam near the unit.
- Select a place where there are no obstacles in front of the unit.
- Make sure that condensation drainage can be conveniently routed away.
- Do not install near a doorway.
- Ensure that the space around the left and right of the unit is more than 5cm. The unit should be installed as high on the wall as possible, allowing a minimum of 5cm from ceiling.
- Use a stud finder to locate studs to prevent unnecessary damage to the wall.

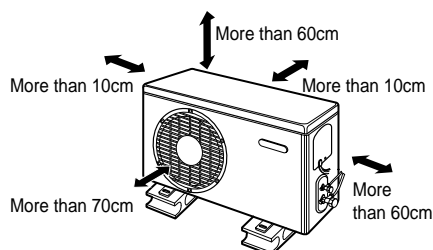


CAUTION

Install the indoor unit on the wall where the height from the floors more than 2.3 meters.

2. Outdoor unit

- If an awning is built over the unit to prevent direct sunlight or rain exposure, make sure that heat radiation from the condenser is not restricted.
- Ensure that the space around the back and sides is more than 10cm. The front of the unit should have more than 70cm of space.
- Do not place animals and plants in the path of the warm air.
- Take the air conditioner weight into account and select a place where noise and vibration are minimum.
- Select a place so that the warm air and noise from the air conditioner do not disturb neighbors.

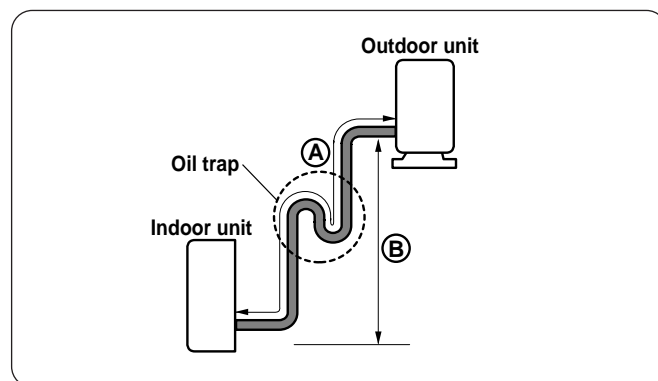
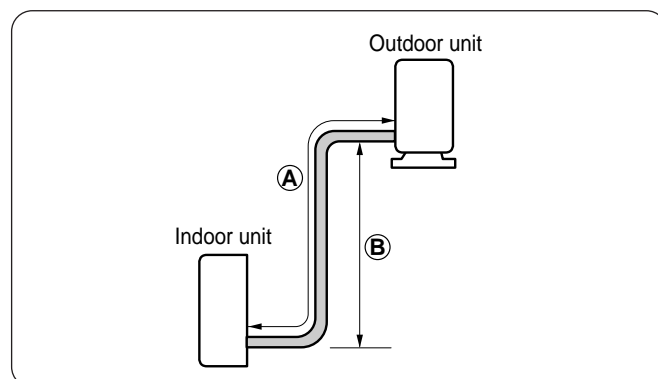


■ Rooftop Installations:

If the outdoor unit is installed on a roof structure, be sure to level the unit. Ensure the roof structure and anchoring method are adequate for the unit location. Consult local codes regarding rooftop mounting.

2) Piping length and elevation

Capacity (Btu/h)	Pipe Size		Standard Length (m)	Max. Elevation Ⓑ (m)	Max. length Ⓐ (m)	Additional Refrigerant (g/m)
	GAS	LIQUID				
18K(60Hz)	5/8"	1/4"	4 or 5	10	20	20
18K(50Hz)	1/2"	1/4"	4 or 5	15	30	30
24K(60Hz)	5/8"	1/4"	4 or 5	15	30	30
24K(50Hz)	5/8"	3/8"	4 or 5	15	30	30



In case more than 5m

CAUTION

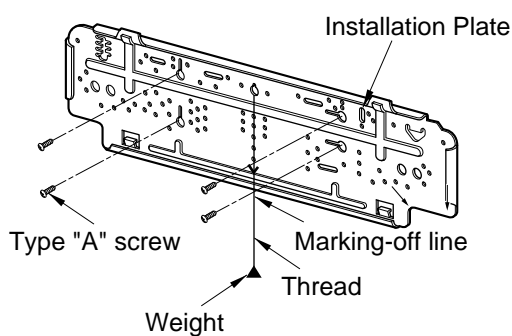
- Capacity is based on standard length and maximum allowance length is on the basis of reliability.
- Oil trap should be installed every 5~7 meters.

3) How to fix installation plate

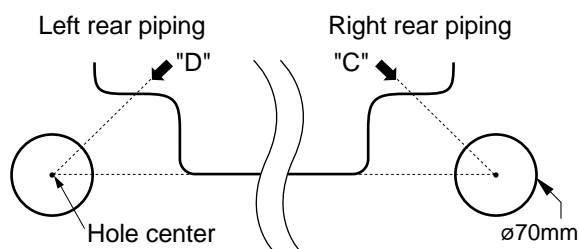
The wall you select should be strong and solid enough to prevent vibration

1. Mount the installation plate on the wall with four type A screws. If mounting the unit on a concrete wall, use anchor bolts.

- Mount the installation plate horizontally by aligning the centerline using a level.

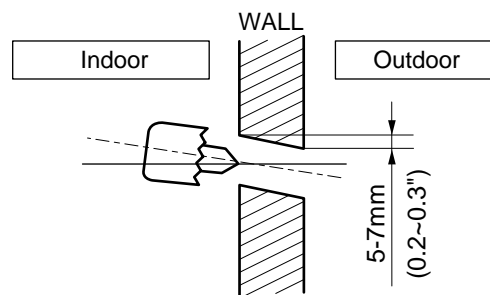


2. Measure the wall and mark the centerline. It is also important to use caution concerning the location of the installation plate-routing of the wiring to power outlets is through the walls typically. Drilling the hole through the wall for piping connections must be done safely.



4) Drill a hole in the wall

- Drill the piping hole with a $\varnothing 70\text{mm}$ hole core drill. Drill the piping hole at either the right or the left with the hole slightly slanted to the outdoor side.



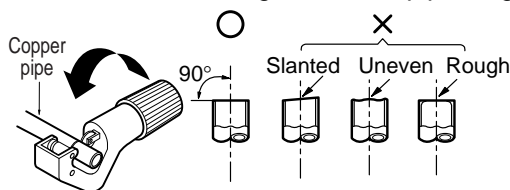
2. Flaring Work and Connection of Piping

1) Flaring work

Main cause for gas leakage is due to defect in flaring work. Carry out correct flaring work in the following procedure.

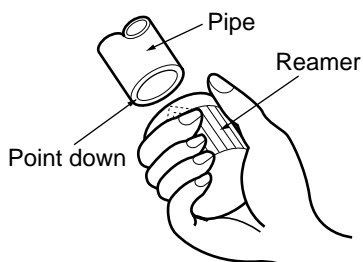
1. Cut the pipes and the cable.

- Use the piping kit accessory or the pipes purchased locally.
- Measure the distance between the indoor and the outdoor unit.
- Cut the pipes a little longer than measured distance.
- Cut the cable 1.5m longer than the pipe length.



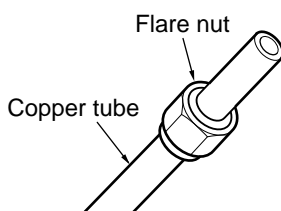
2. Burrs removal

- Completely remove all burrs from the cut cross section of pipe/tube.
- Put the end of the copper tube/pipe in a downward direction as you remove burrs in order to avoid dropping burrs into the tubing.



3. Putting nut on

- Remove flare nuts attached to indoor and outdoor unit, then put them on pipe/tube having completed burr removal. (not possible to put them on after flaring work)

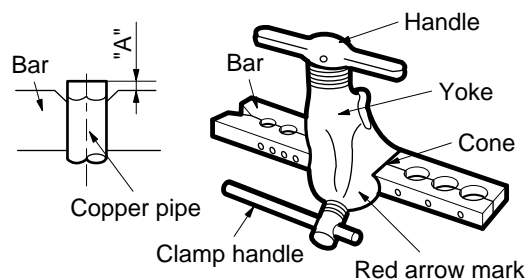


4. Flaring work

- Carry out flaring work using flaring tool as shown below.

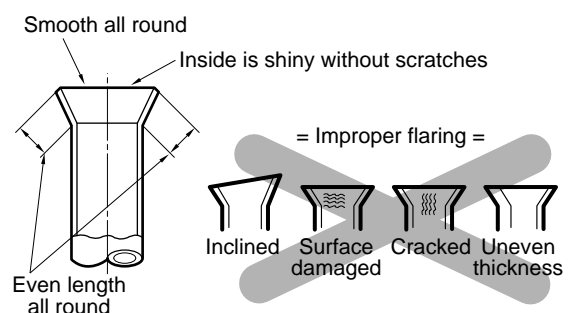
Outside diameter		A
mm	inch	mm
ø6.35	1/4	0 ~ 0.5
ø9.52	3/8	0 ~ 0.5
ø12.7	1/2	0 ~ 0.5
ø15.88	5/8	0 ~ 1.0

Firmly hold copper pipe in a die in the dimension shown in the table above.



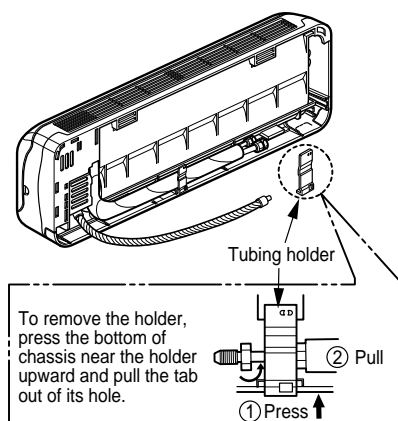
5. Check

- Compare the flared work with figure below.
- If flare is noted to be defective, cut off the flared section and do flaring work again.



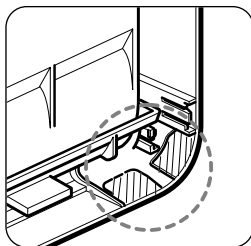
2) Connection of piping-Indoor

- Preparing the indoor unit's piping and drain hose for installation through the wall.
- Remove the plastic tubing retainer(see illustration below) and pull the tubing and drain hose away from chassis.
- Replace the plastic tubing holder in the original position.



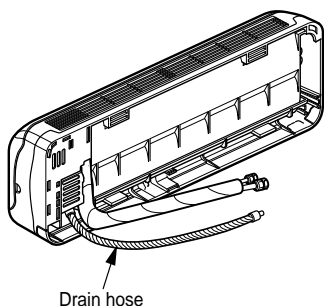
CAUTION

When install, make sure that the remaining parts must be removed clearly so as not to damage the piping and drain hose, especially power cord and connecting cable.



For left rear piping

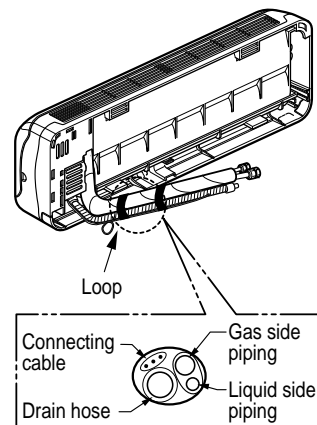
1. Route the indoor tubing and the drain hose in the direction of rear left.



2. Insert the connecting cable into the indoor unit from the outdoor unit through the piping hole.

- Do not connect the cable to the indoor unit.
- Make a small loop with the cable for easy connection later.

3. Tape the tubing, drain hose and the connecting cable. Be sure that the drain hose is located at the lowest side of the bundle. Locating at the upper side can cause drain pan to overflow inside the unit.

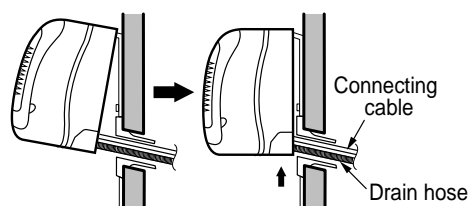


NOTE: If the drain hose is routed inside the room, insulate the hose with an insulation material* so that dripping from "sweating"(condensation) will not damage furniture or floors.

*Foamed polyethylene or equivalent is recommended.

4. Indoor unit installation

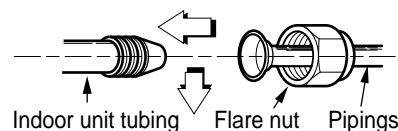
- Hook the indoor unit onto the upper portion of the installation plate.(Engage the two hooks of the rear top of the indoor unit with the upper edge of the installation plate.) Ensure that the hooks are properly seated on the installation plate by moving it left and right.



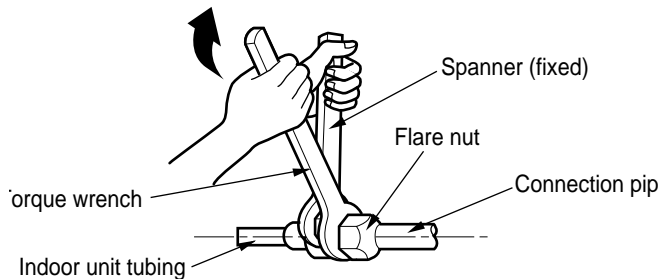
Press the lower left and right sides of the unit against the installation plate until the hooks engage into their slots(clicking sound).

5. Connecting the pipings to the indoor unit and drain hose to drain pipe.

- Align the center of the pipings and sufficiently tighten the flare nut by hand.

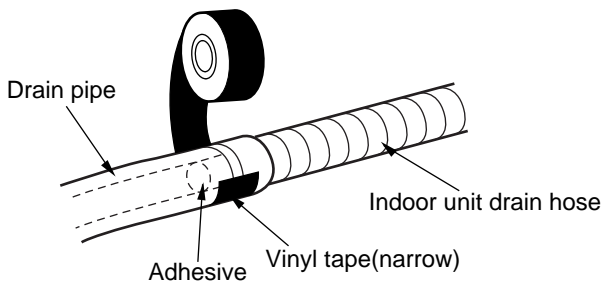


- Tighten the flare nut with a wrench.



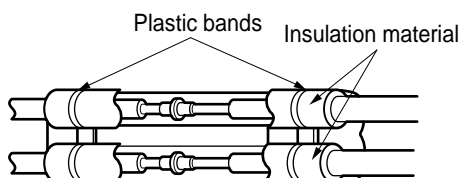
Capacity (Btu/h)	Pipe Size[Torque]	
	GAS	LIQUID
18K, 24K, 26K	1/2"[5.5kg·m]	1/4"[1.8kg·m]
	5/8"[6.6kg·m]	3/8"[4.2kg·m]

- When extending the drain hose at the indoor unit, install the drain pipe.

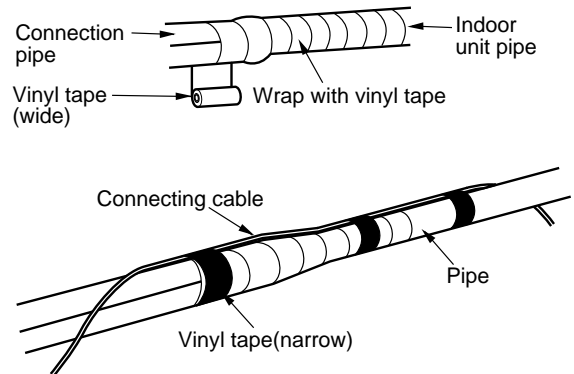


6. Wrap the insulation material around the connecting portion.

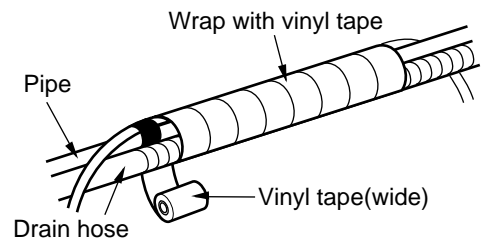
- Overlap the connection pipe insulation material and the indoor unit pipe insulation material. Bind them together with vinyl tape so that there is no gap.



- Wrap the area which accommodates the rear piping housing section with vinyl tape.

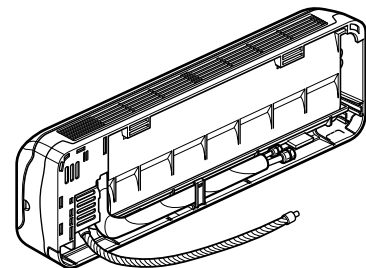


- Bundle the piping and drain hose together by wrapping them with vinyl tape over the range within which they fit into the rear piping housing section.

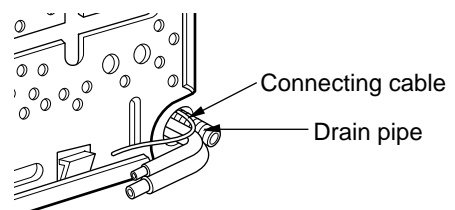


For right rear piping

1. Route the indoor tubing and the drain hose to the required piping hole position.



2. Insert the piping, drain hose and the connecting cable into the piping hole.

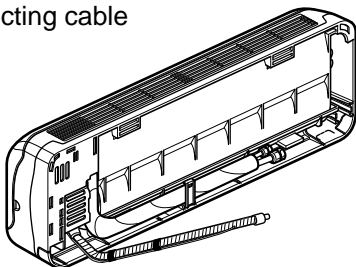


3. Insert the connecting cable into the indoor unit.

- Don't connect the cable to the indoor unit.
- Make a small loop with the cable for easy connection later.

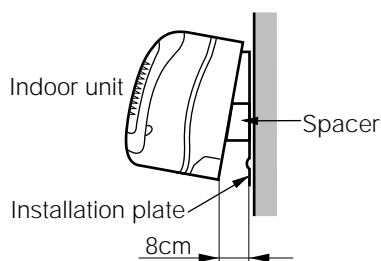
4. Tape the drain hose and the connecting cable.

- Connecting cable



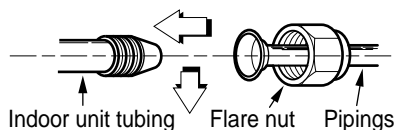
5. Indoor unit installation

- Hang the indoor unit from the hooks at the top of the installation plate.
- Insert the spacer etc. between the indoor unit and the installation plate and separate the bottom of the indoor unit from the wall.

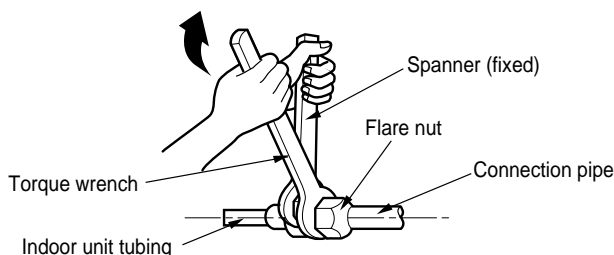


6. Connecting the pipings to the indoor unit and the drain hose to drain pipe.

- Align the center of the pipings and sufficiently tighten the flare nut by hand.

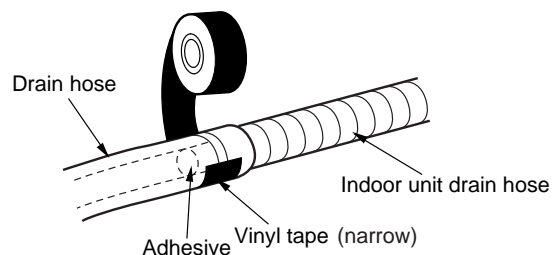


- Tighten the flare nut with a wrench.



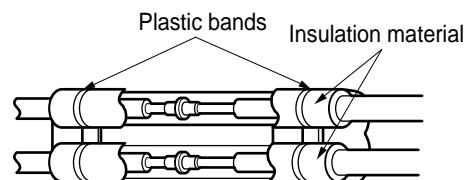
Capacity (Btu/h)	Pipe Size[Torque]	
	GAS	LIQUID
18K, 24K, 26K	1/2"[5.5kg·m]	1/4"[1.8kg·m]
	5/8"[6.6kg·m]	3/8"[4.2kg·m]

- When extending the drain hose at the indoor unit, install the drain pipe.

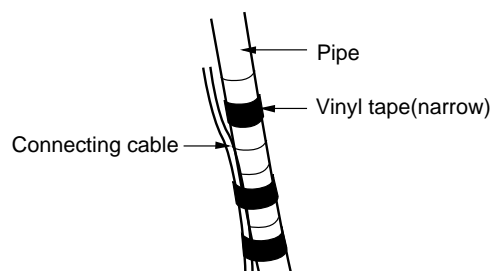
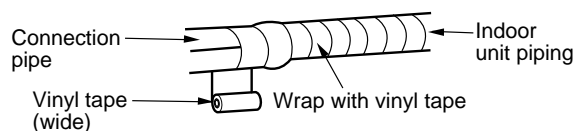


7. Wrap the insulation material around the connecting portion.

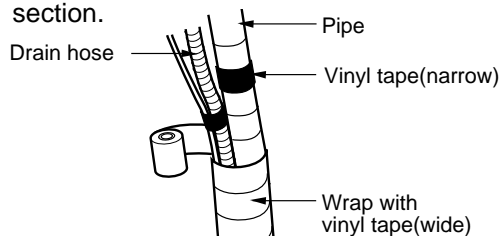
- Overlap the connection pipe heat insulation and the indoor unit pipe heat insulation material. Bind them together with vinyl tape so that there is no gap.



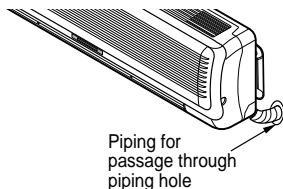
- Wrap the area which accommodates the rear piping housing section with vinyl tape.



- Bundle the piping and drain hose together by wrapping them with cloth tape over the range within which they fit into the rear piping housing section.

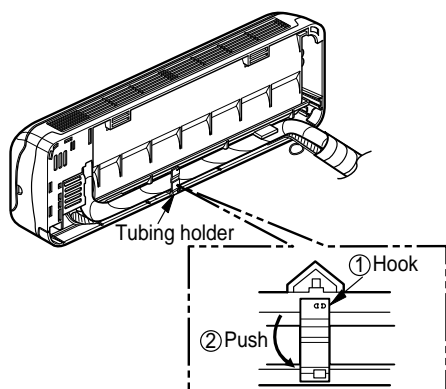


8. Reroute the pipings and the drain hose across the back of the chassis.



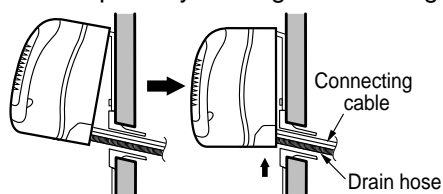
9. Set the pipings and the drain hose to the back of the chassis with the tubing holder.

- Hook the edge of tubing holder to tap on chassis and push the bottom of tubing holder to be engaged at the bottom of chassis.



10. Indoor unit installation

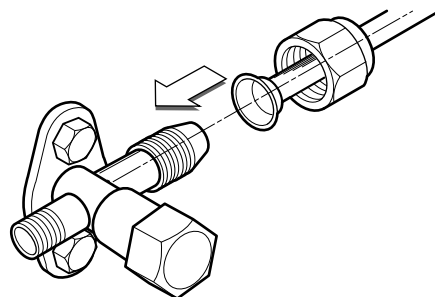
- Remove the spacer.
- Ensure that the hooks are properly seated on the installation plate by moving it left and right.



Press the lower left and right sides of the unit against the installation plate until the hooks engage into their slots(clicking sound).

3) Connection of the pipes-Outdoor

1. Align the center of the pipings and sufficiently tighten the flare nut by hand.

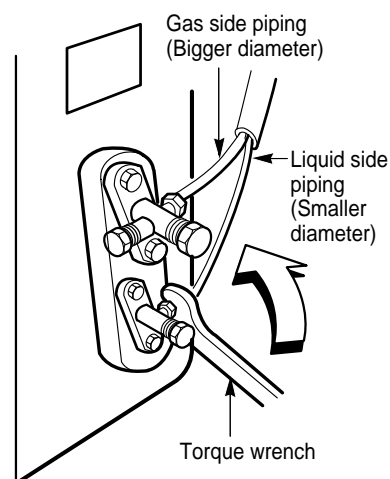


2. Finally, tighten the flare nut with torque wrench until the wrench clicks.

- When tightening the flare nut with torque wrench, ensure the direction for tightening follows the arrow on the wrench.

Capacity (Btu/h)	Pipe Size[Torque]	
	GAS	LIQUID
18K, 24K, 26K	1/2"[5.5kg·m]	1/4"[1.8kg·m]
	5/8"[6.6kg·m]	3/8"[4.2kg·m]

Outdoor unit



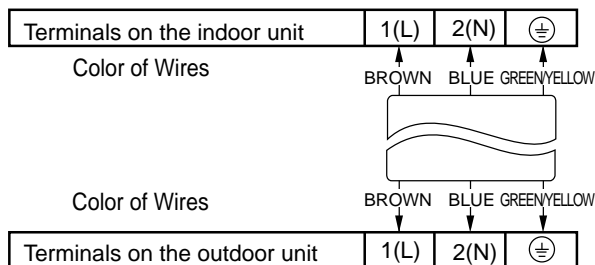
3. Connecting the Cable Between Indoor Unit and Outdoor Unit

1) Connect the cable to the Indoor unit.

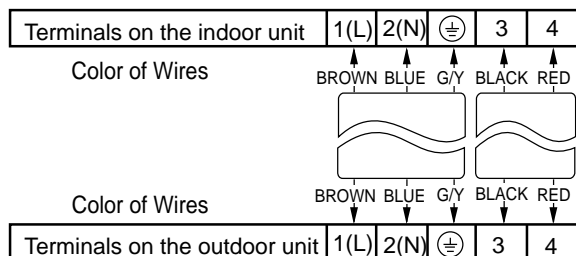
- Connect the cable to the indoor unit by connecting the wires to the terminals on the control board individually according to the outdoor unit connection.

(Ensure that the color of the wires of the outdoor unit and the terminal No. are the same as those of the indoor unit.)

• Cooling model

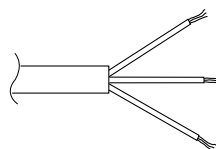


• Heat pump model



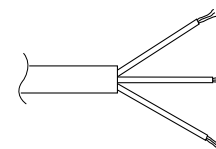
CAUTION

The power cord connected to the indoor unit should be complied with the following specifications (Type H05VV-F approved by HAR or SAA).



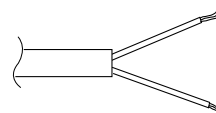
Capacity (Btu/h)	NORMAL CROSS-SECTIONAL AREA
18K	1.5mm ²
24K 26K	2.5mm ²

The power connecting cable connected to the indoor and outdoor unit should be complied with the following specifications (Type H07RN-F approved by HAR or SAA).



Capacity (Btu/h)	NORMAL CROSS-SECTIONAL AREA
18K	1.5mm ²
24K 26K	2.5mm ²

The connecting cable connected to the indoor and outdoor unit should be complied with the following specifications (Type H07RN-F approved by HAR or SAA).

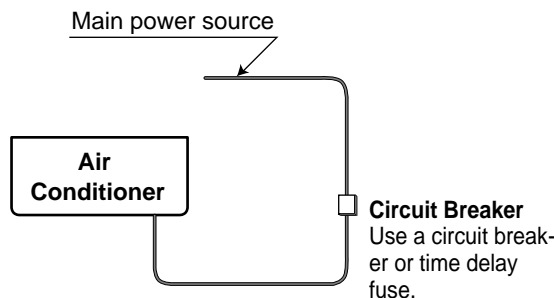


NORMAL
CROSS-SECTIONAL
AREA 0.75mm²

The length of the power supply cord should be over 1.8m measured from the power supply cord entry of the cabinet to the middle of the live pin of the plug.

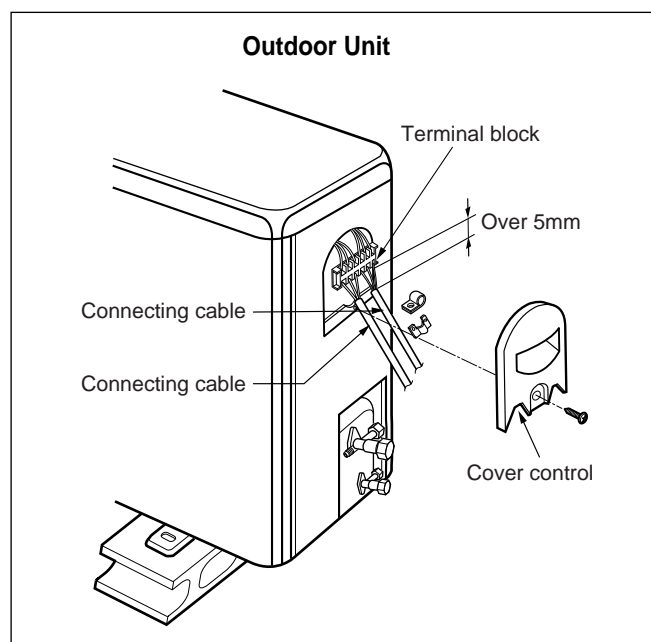
CAUTION

If a power plug is not to be used, provide a circuit breaker between power source and the unit as shown below.



2) Connect the cable to the outdoor unit

1. Remove the control cover from the unit by loosening the screw.
Connect the wires to the terminals on the control board individually.
2. Secure the cable onto the control board with the cord clamp.
3. Refix the control cover to the original position with the screw.
4. Use a recognized circuit breaker 20A (18K), 25A (24K, 26K) between the power source and the unit. A disconnecting device to adequately disconnect all supply lines must be fitted.



CAUTION

After the confirmation of the above conditions, prepare the wiring as follows:

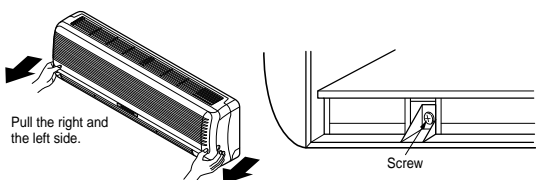
- 1) **Never fail to have an individual power circuit specifically for the air conditioner. As for the method of wiring, be guided by the circuit diagram posted on the inside of control cover.**
- 2) The screw which fasten the wiring in the casing of electrical fittings are liable to come loose from vibrations to which the unit is subjected during the course of transportation. Check them and make sure that they are all tightly fastened. (If they are loose, it could cause burn-out of the wires.)
- 3) Specification of power source.
- 4) Confirm that electrical capacity is sufficient.
- 5) See to that the starting voltage is maintained at more than 90 percent of the rated voltage marked on the name plate.
- 6) Confirm that the cable thickness is as specified in the power source specification. (Particularly note the relation between cable length and thickness. (Refer to page 11))
- 7) Always install an earth leakage circuit breaker in a wet or moist area.
- 8) The following would be caused by voltage drop.
 - Vibration of a magnetic switch, which will damage the contact point, fuse breaking, disturbance of the normal function of the overload.
- 9) The means for disconnection from a power supply shall be incorporated in the fixed wiring and have an air gap contact separation of at least 3mm in each active(phase) conductors.

4. Checking the Drainage and Forming the Pippings

1) Checking the drainage

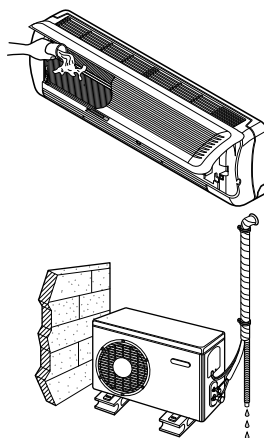
1. To remove the front panel from the indoor unit, remove the front panel from the indoor unit cabinet.

- Set the air direction louvers up-and-down to the position(horizontally) by hand.
- Remove the securing screws that retain the front panel. Pull the lower left and right sides of the grille toward you and lift it off.



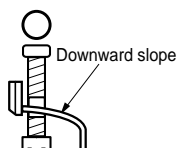
2. To check the drainage.

- Pour a glass of water on the evaporator.
- Ensure the water flows through the drain hose of the indoor unit without any leakage and goes out the drain exit.

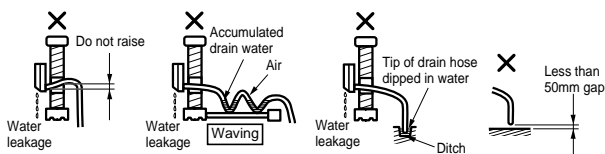


3. Drain piping

- The drain hose should point downward for easy drain flow.



- Do not make drain piping.



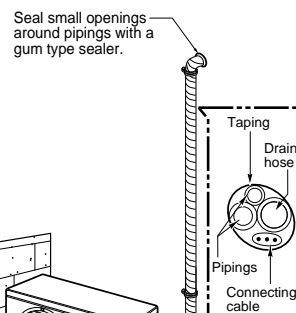
2) Form the piping

1. Form the piping by wrapping the connecting portion of the indoor unit with insulation material and secure it with two kinds of vinyl tapes.

- If you want to connect an additional drain hose, the end of the drain outlet should be routed above the ground. Secure the drain hose appropriately.

2. In cases where the outdoor unit is installed below the indoor unit perform the following.

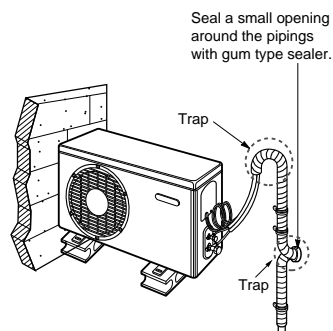
- Tape the piping, drain hose and connecting cable from down to up.
- Secure the tapped piping along the exterior wall using saddle or equivalent.



Trap is required to prevent water from entering into electrical parts.

3. In cases where the Outdoor unit is installed above the Indoor unit perform the following.

- Tape the piping and connecting cable from down to up.
- Secure the taped piping along the exterior wall. Form a trap to prevent water entering the room.
- Fix the piping onto the wall by saddle or equivalent.



5. Air Purging

1) Air purging

Air and moisture remaining in the refrigerant system have undesirable effects as indicated below.

- Pressure in the system rises.
- Operating current rises.
- Cooling(or heating) efficiency drops.
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Water may lead to corrosion of parts in the refrigeration system.

Therefore, the indoor unit and tubing between the indoor and outdoor unit must be leak tested and evacuated to remove any noncondensables and moisture from the system.

2) Air purging with vacuum pump

1. Preparation

- Check that each tube(both liquid and gas side tubes) between the indoor and outdoor units have been properly connected and all wiring for the test run has been completed. Remove the service valve caps from both the gas and the liquid side on the outdoor unit. Note that both the liquid and the gas side service valves on the outdoor unit are kept closed at this stage.

2. Leak test

- Connect the manifold valve(with pressure gauges) and dry nitrogen gas cylinder to this service port with charge hoses.

CAUTION

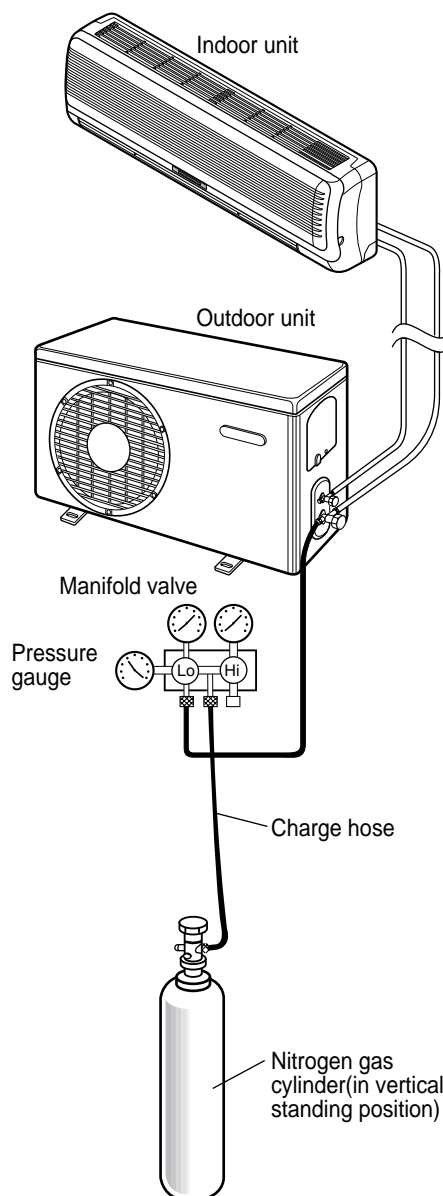
Be sure to use a manifold valve for air purging. If it is not available, use a stop valve for this purpose. The "Hi" knob of the manifold valve must always be kept close.

- Pressurize the system to no more than 150 P.S.I.G. with dry nitrogen gas and close the cylinder valve when the gauge reading reached 150 P.S.I.G. Next, test for leaks with liquid soap.

CAUTION

To avoid nitrogen entering the refrigerant system in a liquid state, the top of the cylinder must be higher than its bottom when you pressurize the system. Usually, the cylinder is used in a vertical standing position.

- Do a leak test of all joints of the tubing(both indoor and outdoor) and both gas and liquid side service valves. Bubbles indicate a leak. Be sure to wipe off the soap with a clean cloth.
- After the system is found to be free of leaks, relieve the nitrogen pressure by loosening the charge hose connector at the nitrogen cylinder. When the system pressure is reduced to normal, disconnect the hose from the cylinder.



Soap water method

- (1) Remove the caps from the 2-way and 3-way valves.
- (2) Remove the service-port cap from the 3-way valve.
- (3) To open the 2-way valve turn the valve stem counter-clockwise approximately 90°, wait for about 2~3 sec, and close it.
- (4) Apply a soap water or a liquid neutral detergent on the indoor unit connection or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping.
- (5) If bubbles come out, the pipes have leakage.

3. Evacuation

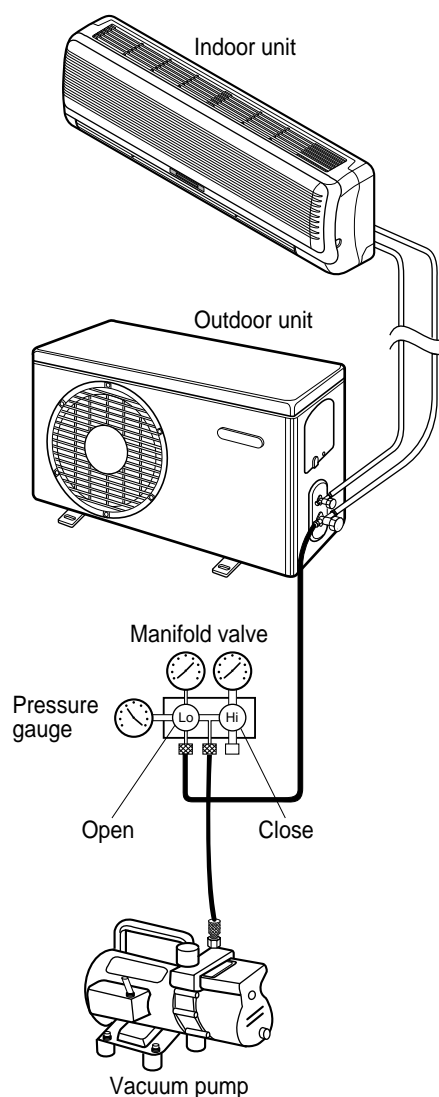
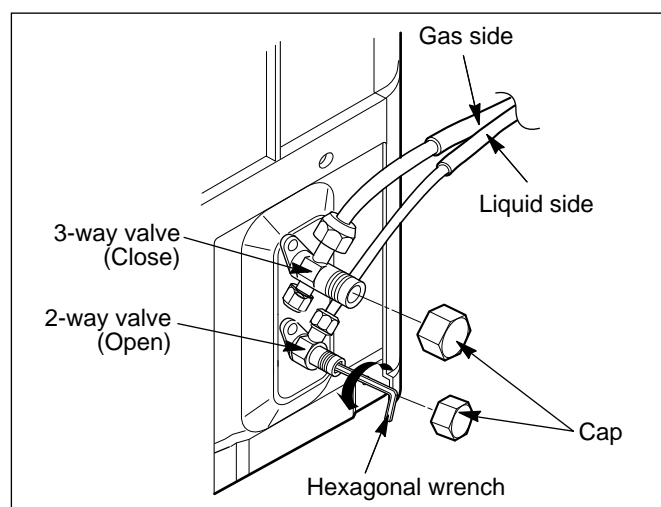
- Connect the charge hose end described in the preceding steps to the vacuum pump to evacuate the tubing and indoor unit. Confirm the "Lo" knob of the manifold valve is open. Then, run the vacuum pump. The operation time for evacuation varies with tubing length and capacity of the pump. The following table shows the time required for evacuation.

Required time for evacuation when 30 gal/h vacuum pump is used	
If tubing length is less than 10m (33 ft)	If tubing length is longer than 10m (33 ft)
10 min. or more	15 min. or more

- When the desired vacuum is reached, close the "Lo" knob of the manifold valve and stop the vacuum pump.

4. Finishing the job

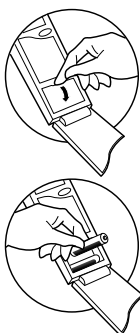
- With a service valve wrench, turn the valve stem of liquid side valve counter-clockwise to fully open the valve.
- Turn the valve stem of gas side valve counter-clockwise to fully open the valve.
- Loosen the charge hose connected to the gas side service port slightly to release the pressure, then remove the hose.
- Replace the flare nut and its bonnet on the gas side service port and fasten the flare nut securely with an adjustable wrench. This process is very important to prevent leakage from the system.
- Replace the valve caps at both gas and liquid side service valves and fasten them tight. This completes air purging with a vacuum pump. The air conditioner is now ready to test run.



1. Check that all tubing and wiring have been properly connected.
2. Check that the gas and liquid side service valves are fully open.

1. Prepare remote control

- 1 Remove the battery cover by pulling it according to the arrow direction.
- 2 Insert new batteries making sure that the (+) and (–) of battery are installed correctly.
- 3 Reattach the cover by pushing it back into position.

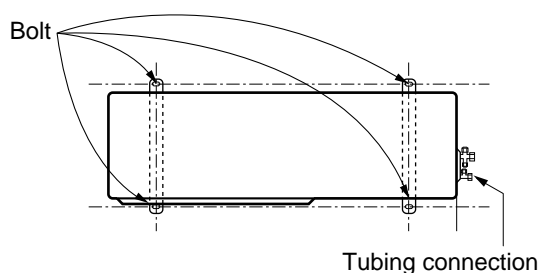


NOTE:

- Use 2 AAA(1.5volt) batteries. Do not use rechargeable batteries.
- Remove the batteries from the remote control if the system is not going to be used for a long time.

2. Settlement of outdoor unit

- Anchor the outdoor unit with a bolt and nut(ø10mm) tightly and horizontally on a concrete or rigid mount.
- When installing on the wall, roof or rooftop, anchor the mounting base securely with a nail or wire assuming the influence of wind and earthquake.
- In the case when the vibration of the unit is conveyed to the hose, secure the unit with an anti-vibration rubber.

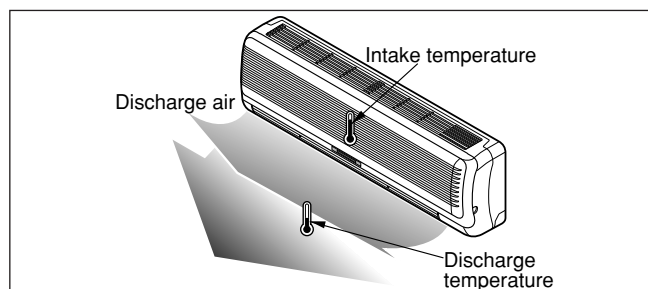


3. Evaluation of the performance

Operate unit for 15~20 minutes, then check the system refrigerant charge:

1. Measure the pressure of the gas side service valve.
2. Measure the temperature of the intake and discharge of air.

3. Ensure the difference between the intake temperature and the discharge is more than 8°C (Cooling) or reversely (Heating).



4. For reference; the gas side pressure of optimum condition is as below.(Cooling)

Outside ambient TEMP	The pressure of the gas side service valve
35°C(95°F)	4.5~5.5kg/cm ² G(63.9~78.1 P.S.I.G.)

NOTE: If the actual pressure are higher than shown, the system is most likely over-charged, and charge should be removed. If the actual pressure are lower than shown, the system is most likely undercharged, and charge should be added.

The air conditioner is now ready for use.

PUMP DOWN

This is performed when the unit is to be relocated or the refrigerant circuit is serviced.

Pump Down means collecting all refrigerant in the outdoor unit without loss in refrigerant gas.

CAUTION:

Be sure to perform Pump Down procedure with the unit cooling mode.

Pump Down Procedure

1. Connect a low-pressure gauge manifold hose to the charge port on the gas side service valve.
2. Open the gas side service valve halfway and purge the air from the manifold hose using the refrigerant gas.
3. Close the liquid side service valve(all the way in).
4. Turn on the unit's operating switch and start the cooling operation.
5. When the low-pressure gauge reading becomes 1 to 0.5kg/cm² G(14.2 to 7.1 P.S.I.G.), fully close the gas side valve stem and then quickly turn off the unit. At that time, Pump Down has been completed and all refrigerant gas will have been collected in the outdoor unit.

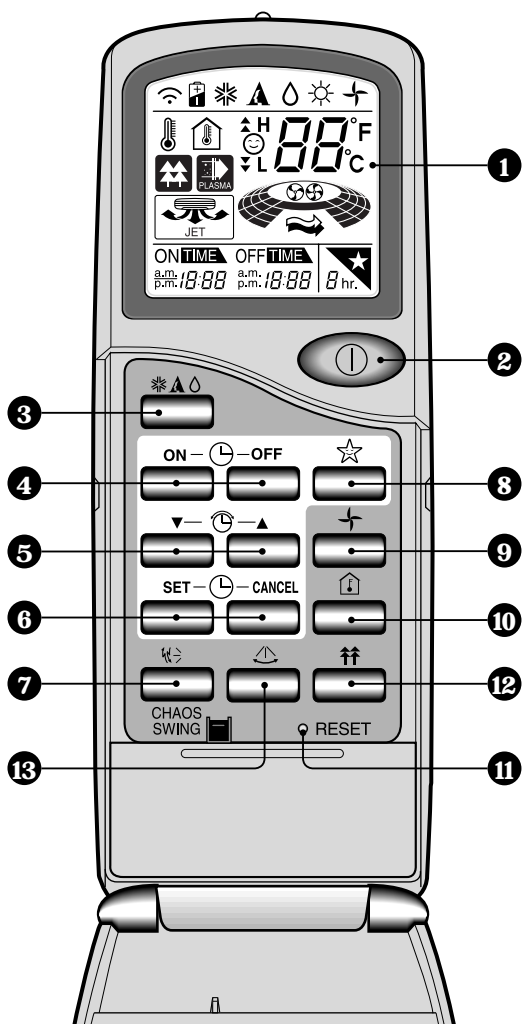
Operation

(1) Name and Function-Remote Control (Cooling Models)

Remote Controller

Signal transmitter.

Transmits the signals to the room air conditioner.



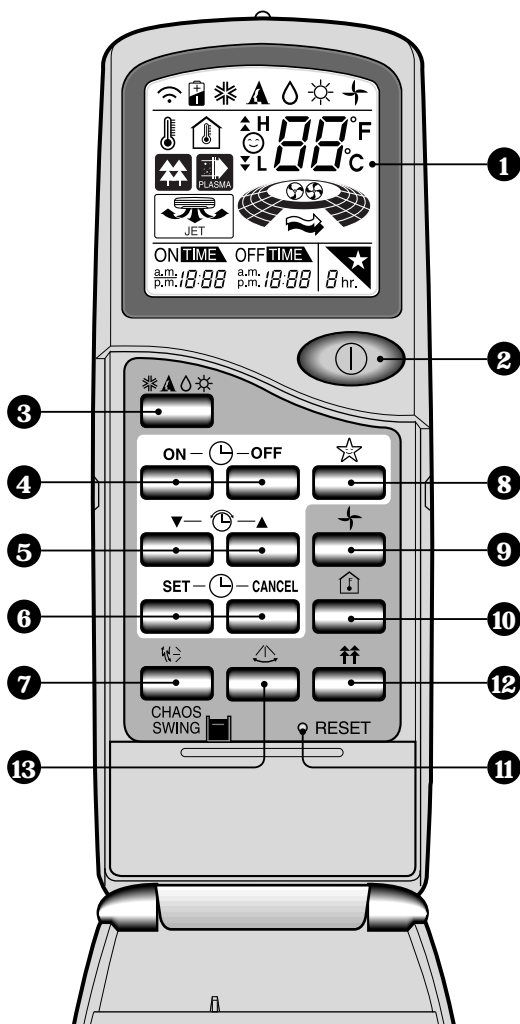
- 1 OPERATION DISPLAY**
Displays the operation conditions.
- 2 START/STOP BUTTON**
Operation starts when this button is pressed and stops when the button is pressed again.
- 3 OPERATION MODE SELECTION BUTTON**
Used to select the operation mode.
- 4 ON/OFF TIMER BUTTONS**
Used to set the time of starting and stopping operation.
- 5 TIME SETTING BUTTONS**
Used to adjust the time.
- 6 TIMER SET/CANCEL BUTTONS**
Used to set the timer when the desired time is obtained and to cancel the Timer operation.
- 7 CHAOS SWING BUTTON**
Used to stop or start louver movement and set the desired up/down airflow direction.
- 8 SLEEP MODE AUTO BUTTON**
Used to set Sleep Mode Auto operation.
- 9 AIR CIRCULATION BUTTON**
Used to circulate the room air without cooling or heating (turns indoor fan on/off).
- 10 ROOM TEMPERATURE CHECKING BUTTON**
Used to check the room temperature.
- 11 RESET BUTTON**
Used prior to resetting time or after replacing batteries.
- 12 NEGATIVE ION (Not on all models)**
Used to generate negative ion.
- 13 HORIZONTAL AIRFLOW DIRECTION CONTROL BUTTON (Not on all models)**
Used to set the desired horizontal airflow direction.

(2) Name and Function-Remote Control (Heat Pump Models)

Remote Controller

Signal transmitter.

Transmits the signals to the room air conditioner.



- 1 OPERATION DISPLAY**
Displays the operation conditions.
- 2 START/STOP BUTTON**
Operation starts when this button is pressed and stops when the button is pressed again.
- 3 OPERATION MODE SELECTION BUTTON**
Used to select the operation mode.
- 4 ON/OFF TIMER BUTTONS**
Used to set the time of starting and stopping operation.
- 5 TIME SETTING BUTTONS**
Used to adjust the time.
- 6 TIMER SET/CANCEL BUTTONS**
Used to set the timer when the desired time is obtained and to cancel the Timer operation.
- 7 CHAOS SWING BUTTON**
Used to stop or start louver movement and set the desired up/down airflow direction.
- 8 SLEEP MODE AUTO BUTTON**
Used to set Sleep Mode Auto operation.
- 9 AIR CIRCULATION BUTTON**
Used to circulate the room air without cooling or heating (turns indoor fan on/off).
- 10 ROOM TEMPERATURE CHECKING BUTTON**
Used to check the room temperature.
- 11 RESET BUTTON**
Used prior to resetting time or after replacing batteries.
- 12 NEGATIVE ION (Not on all models)**
Used to generate negative ion.
- 13 HORIZONTAL AIRFLOW DIRECTION CONTROL BUTTON (Not on all models)**
Used to set the desired horizontal airflow direction.

Disassembly of the parts (Indoor unit)

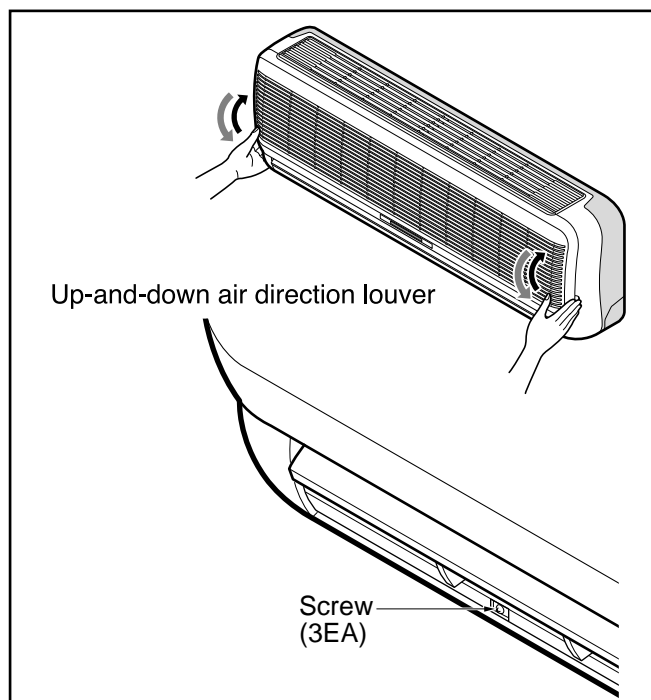
Warning :

Disconnect the unit from power supply before making any checks.

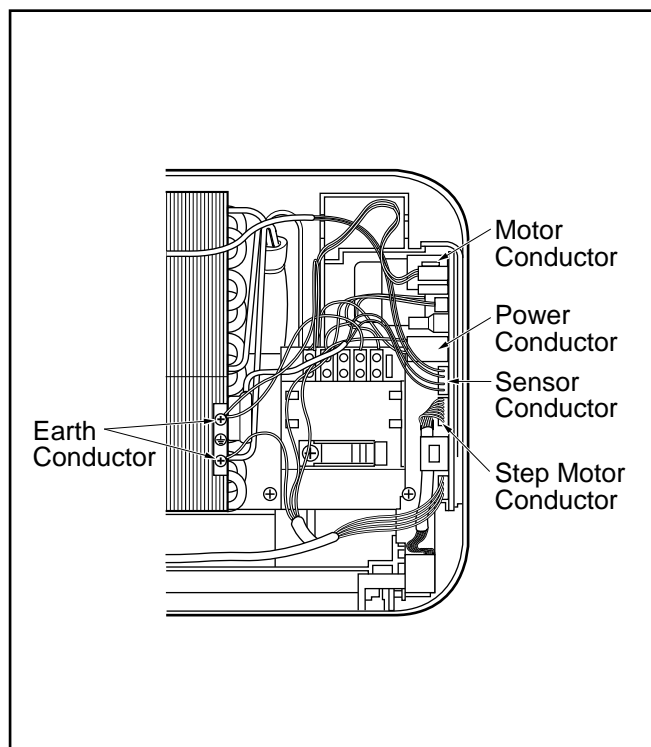
Be sure the power switch is set to "OFF".

To remove the Grille from the Chassis.

- Set the up-and-down air discharge louver to open position (horizontally) by finger pressure.
- Remove the securing screws
- To remove the Grille, pull the lower left and right side of the grille toward you (slightly tilted) and lift it straight upward.

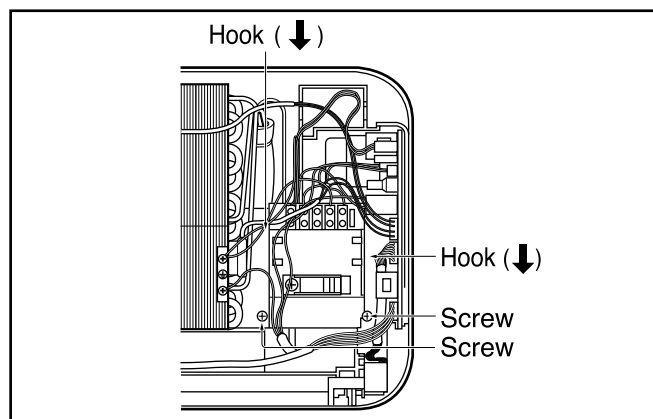


1. To remove the sensor, housing connect, earth conductor & step motor conductor with sensor holder, Motor, Evaporator & P.C.B.



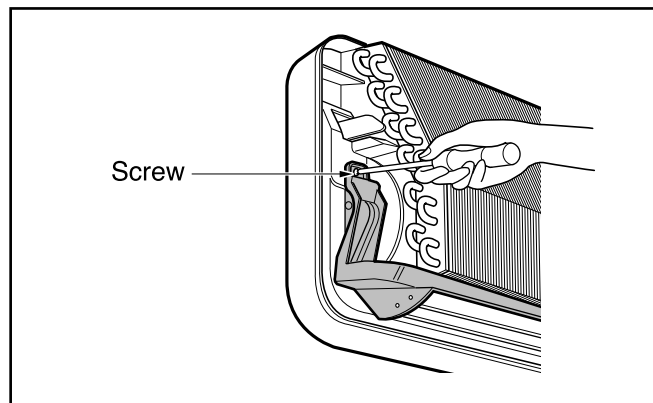
2. To remove the Control Box.

- Remove 2 securing screws.
- Pull the control box out from the chassis carefully.



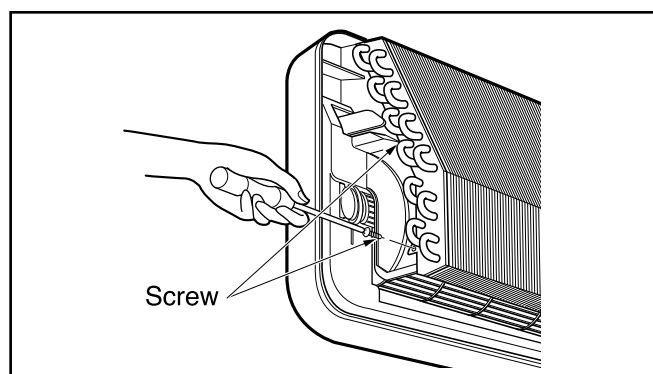
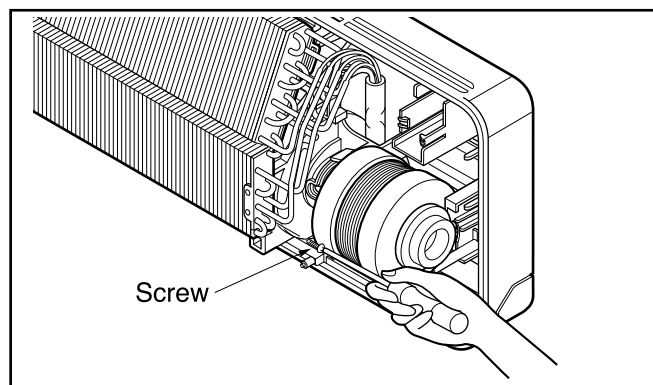
3. To remove the Discharge Grille.

- Remove the securing screw.
- Pressing the right side of the discharge grille downward slightly, unhook the discharge grille.
- Pull the discharge grille out from the chassis carefully.

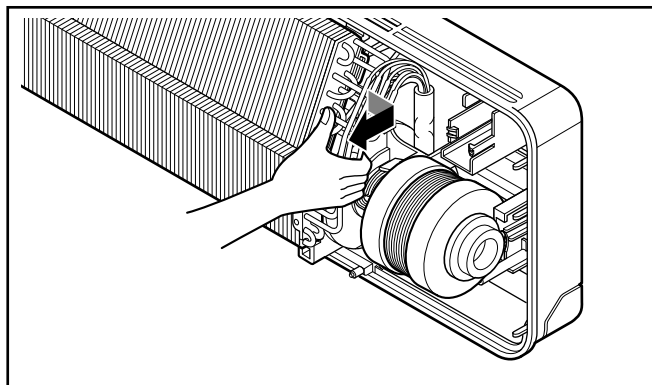


4. To remove the Evaporator.

- Remove 3 screws securing the evaporator(at the left 1EA, at the right 2EA).

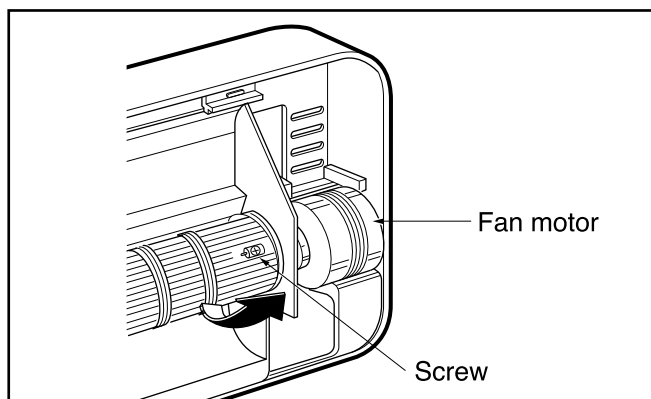


- Unhook the tab on the right inside of the chassis at the same time, slightly pull the evaporator toward you until the tab is clear of the slot.

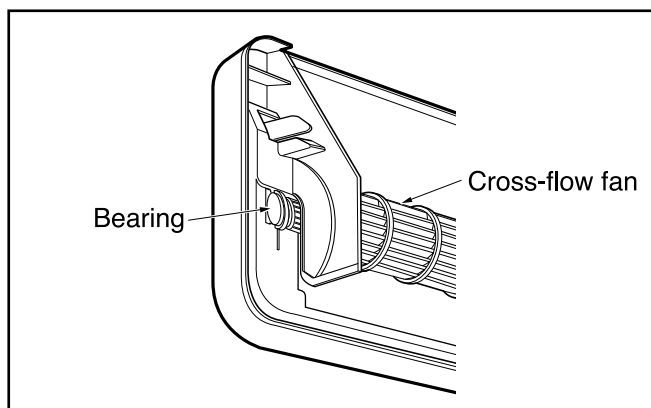


5. To remove the Cross-Flow Fan

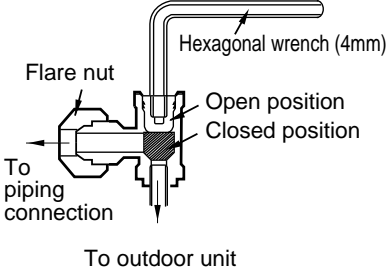
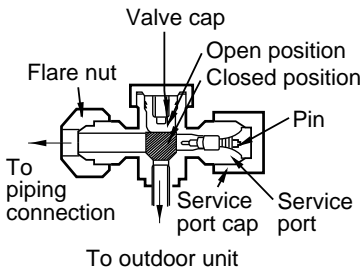
- Loosen the screw securing the cross-flow fan to the fan motor (do not remove).
- Lift up the right side of the cross-flow fan and the fan motor, separate the fan motor from the cross-flow fan.



- Remove the left end of the cross-flow fan from the self-aligning bearing.



2-way, 3-way Valve

		2-way Valve (Liquid Side)	3-way Valve (Gas Side)	
				
Works		Shaft position	Shaft position	Service port
Shipping		Closed (with valve cap)	Closed (with valve cap)	Closed (with cap)
1.	Air purging (Installation)	Open (counter-clockwise)	Closed (clockwise)	Open (push-pin or with vacuum pump)
Operation		Open (with valve cap)	Open (with valve cap)	Closed (with cap)
2.	Pumping down (Transferring)	Closed (clockwise)	Open (counter-clockwise)	Open (connected manifold gauge)
3.	Evacuation (Servicing)	Open	Open	Open (with vacuum pump)
4.	Gas charging (Servicing)	Open	Open	Open (with charging cylinder)
5.	Pressure check (Servicing)	Open	Open	Open (with charging cylinder)
6.	Gas releasing (Servicing)	Open	Open	Open (with charging cylinder)

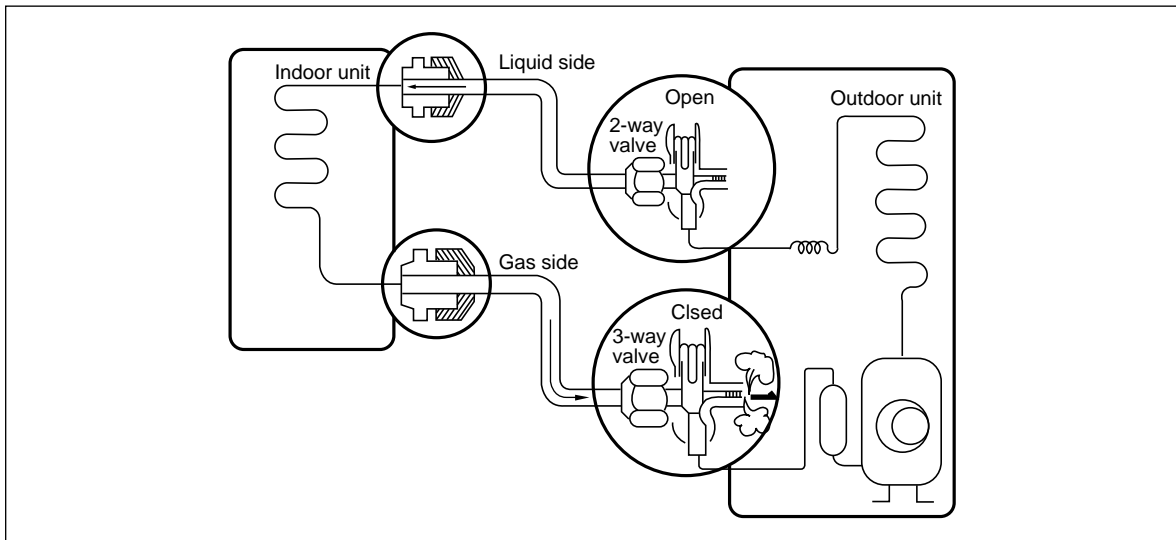
1. Air purging

Required tools: Hexagonal wrench, adjustable wrench, torque wrenches, wrench to hold the joints, and gas leak detector.

The additioner gas for air purging has been charged in the outdoor unit.

However, if the flare connections have not been done correctly and there gas leaks, a gas cylinder and the charge set will be needed.

The air in the indoor unit and in the piping must be purged. If air remains in the refrigeration pipes, it will affect the compressor, reduce to cooling capacity, and could lead to a malfunction.



Service port nut.

Be sure, using a torque wrench to tighten the service port nut (after using the service port), so that it prevents the gas leakage from the refrigeration cycle.

CAUTION: Do not leak the gas in the air during Air purging.

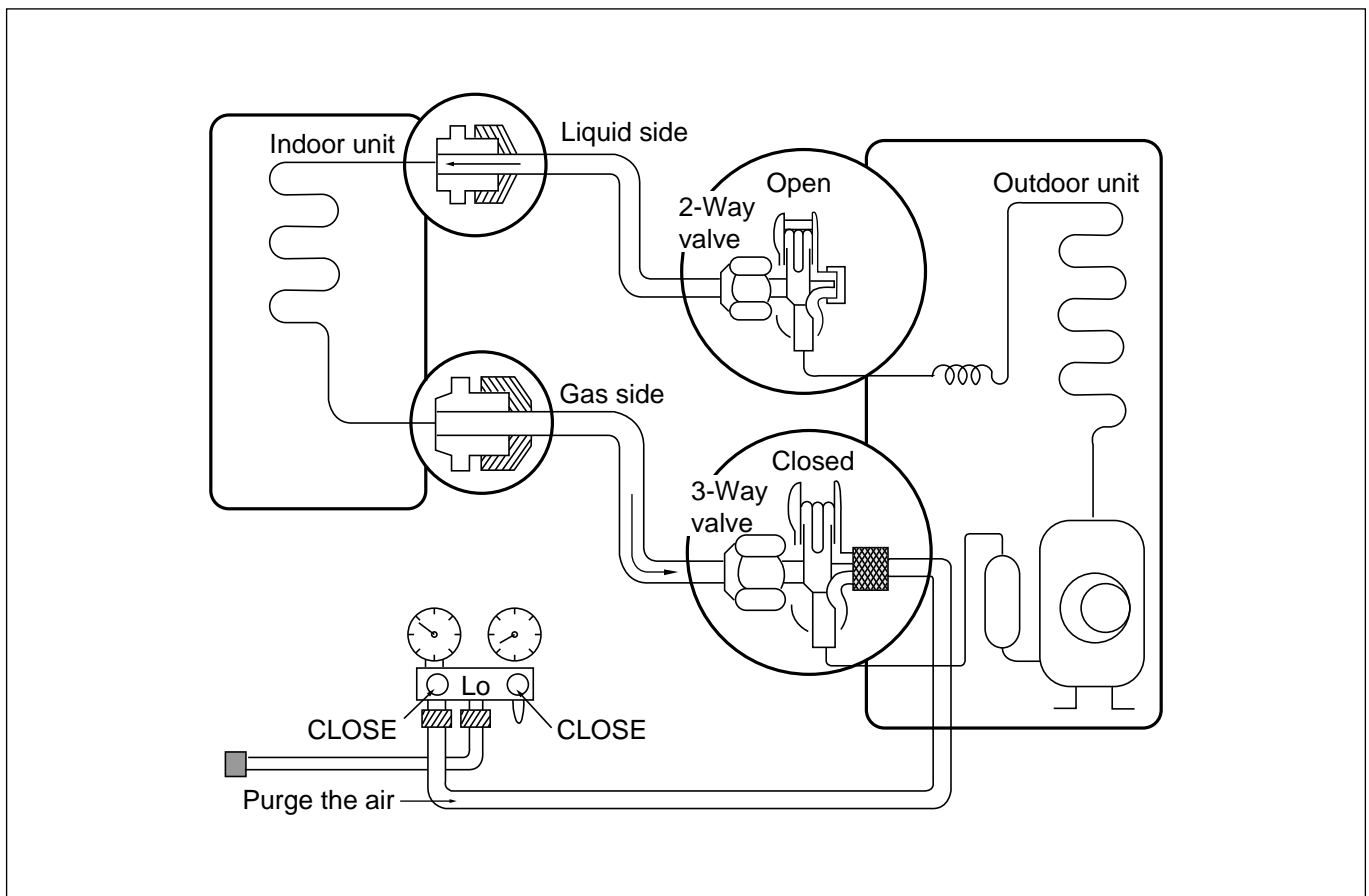
• Procedure

- (1) Recheck the piping connections.
- (2) Open the valve stem of the liquid side valve counterclockwise approximately 90, wait 10 seconds, and then set it to closed position.
 - Be sure to use a hexagonal wrench to operate the valve stem.
- (3) Check for gas leakage.
 - Check the flare connections for gas leakage.
- (4) Purge the air from the system.
 - Set the liquid side valve to the open position and remove the cap from the gas side valve's service port.
 - Using the hexagonal wrench to press the valve core pin, discharge for three seconds and then wait for one minute. Repeat this three times.
- (5) Use torque wrench to tighten the service port nut to a torque of 1.8kg.cm.
- (6) Set the gas side valve to the back seat.
- (7) Mount the valve stem nuts to the gas side and liquid side valves.
- (8) Check for gas leakage.
 - At this time, especially check for gas leakage from the stem nuts of both valves and from the service port nut.

Caution

If gas leakage are discovered in step (3) above, take the following measures:
If the gas leaks stop when the piping connections are tightened further, continue working from step (4).
If the gas leaks do not stop when the connections are retightened, repair the location of the leak, discharge all of the gas through the service port, and then recharge with the specified amount of

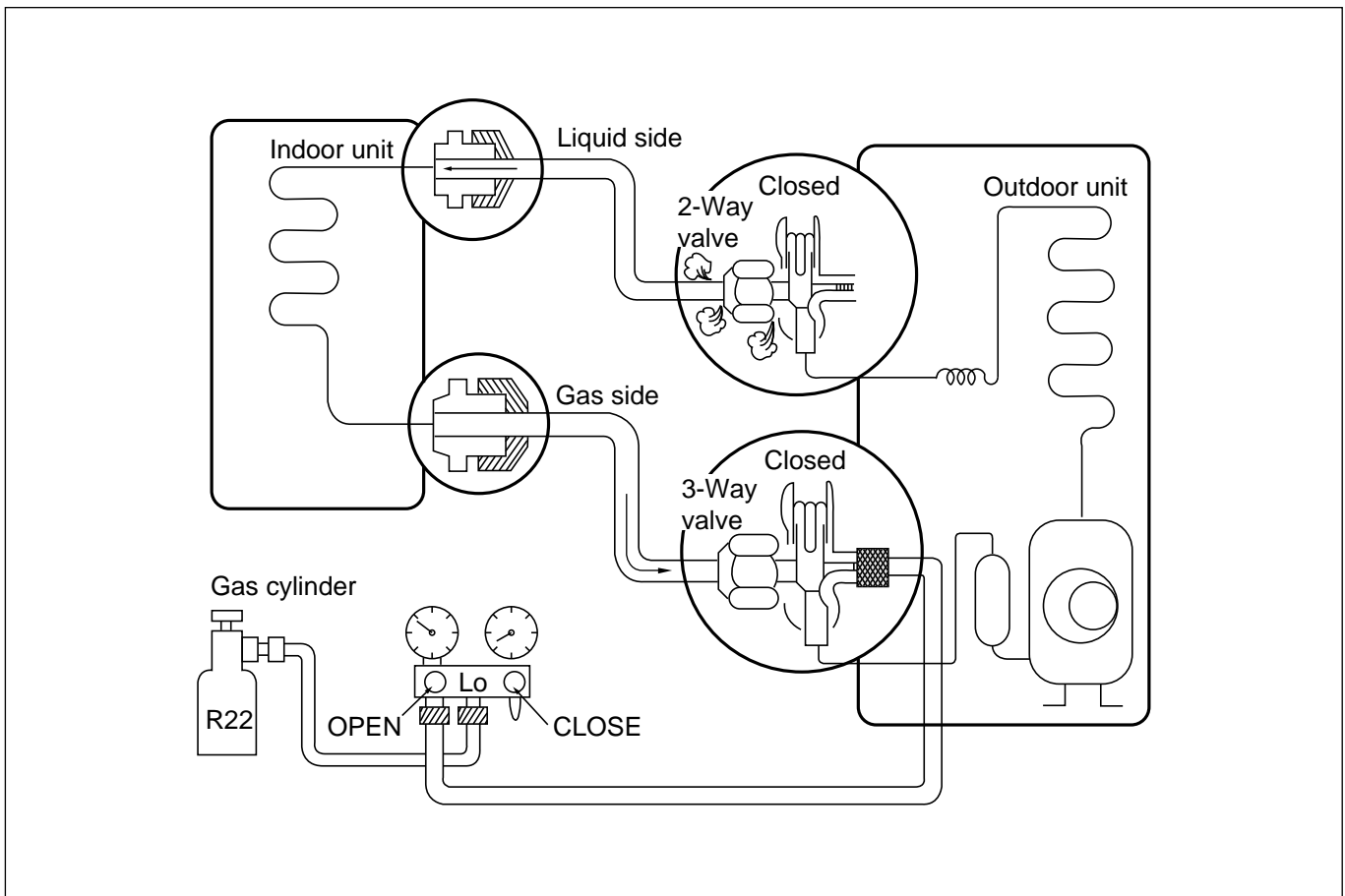
2. Pumping down



• Procedure

- (1) **Confirm that both liquid side and gas side valves are set to the open position.**
 - Remove the valve stem caps and confirm that the valve stems are in the raised position.
 - Be sure to use a hexagonal wrench to operate the valve stems.
- (2) **Operate the unit for 10 to 15 minutes.**
- (3) **Stop operation and wait for 3 minutes, then connect the charge set to the service port of the 3-way valve.**
 - Connect the charge hose to the service port.
- (4) **Air purging of the charge hose.**
 - Open the low-pressure valve on the charge set slightly to air purge from the charge hose.
- (5) **Set the liquid side valve to the closed position.**
- (6) **Operates the air conditioner in cooling mode and stop it when the gauge indicates 1kg/cm²g.**
- (7) **Immediately set the 3-way valve to the closed position.**
 - Do this quickly so that the gauge ends up indicating 3 to 5kg/cm²g.
- (8) **Disconnect the charge set, and mount the 2-way and 3-way valve's stem nuts and the service port nut.**
 - Use torque wrench to tighten the service port nut to a torque of 1.8kg.m.
 - Be sure to check for gas leakage.

1) Re-air purging (Re-installation)



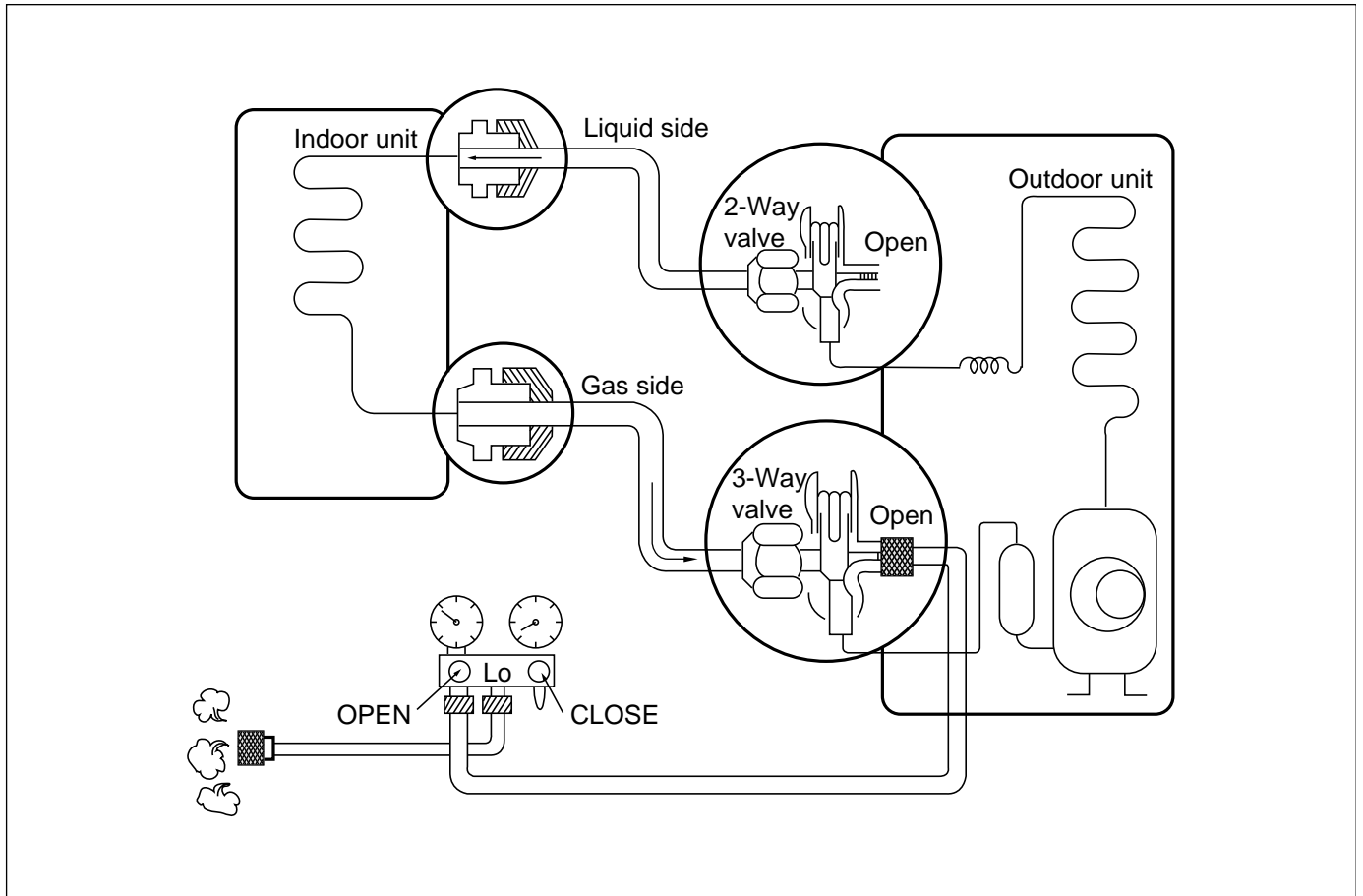
• Procedure

- (1) Confirm that both the liquid side valve and the gas side valve are set to the closed position.
- (2) Connect the charge set and a gas cylinder to the service port of the 3-way valve.
 - Leave the valve on the gas cylinder closed.
- (3) Air purging.
 - Open the valves on the gas cylinder and the charge set. Purge the air by loosening the flare nut on the liquid side valve approximately 45° for 3 seconds then closing it for 1 minute; repeat 3 times.
 - After purging the air, use a torque wrench to tighten the flare nut on liquid side valve.
- (4) Check for gas leakage.
 - Check the flare connections for gas leakage.
- (5) Discharge the refrigerant.
 - Close the valve on the gas cylinder and discharge the refrigerant until the gauge indicates 3 to 5 kg/cm²g.
- (6) Disconnect the charge set and the gas cylinder, and set the 2-way and 3-way valves to the open position.
 - Be sure to use a hexagonal wrench to operate the valve stems.
- (7) Mount the valve stem nuts and the service port nut.
 - Use torque wrench to tighten the service port nut to a torque of 1.8 kg.m.
 - Be sure to check for gas leakage.

CAUTION:

Do not leak the gas in the air during Air Purging.

2) Balance refrigerant of the 2-way, 3-way valves (Gas leakage)



• Procedure

(1) Confirm that both the liquid side and gas side valves are set to the back seat.

(2) Connect the charge set to the 3-way valve's port.

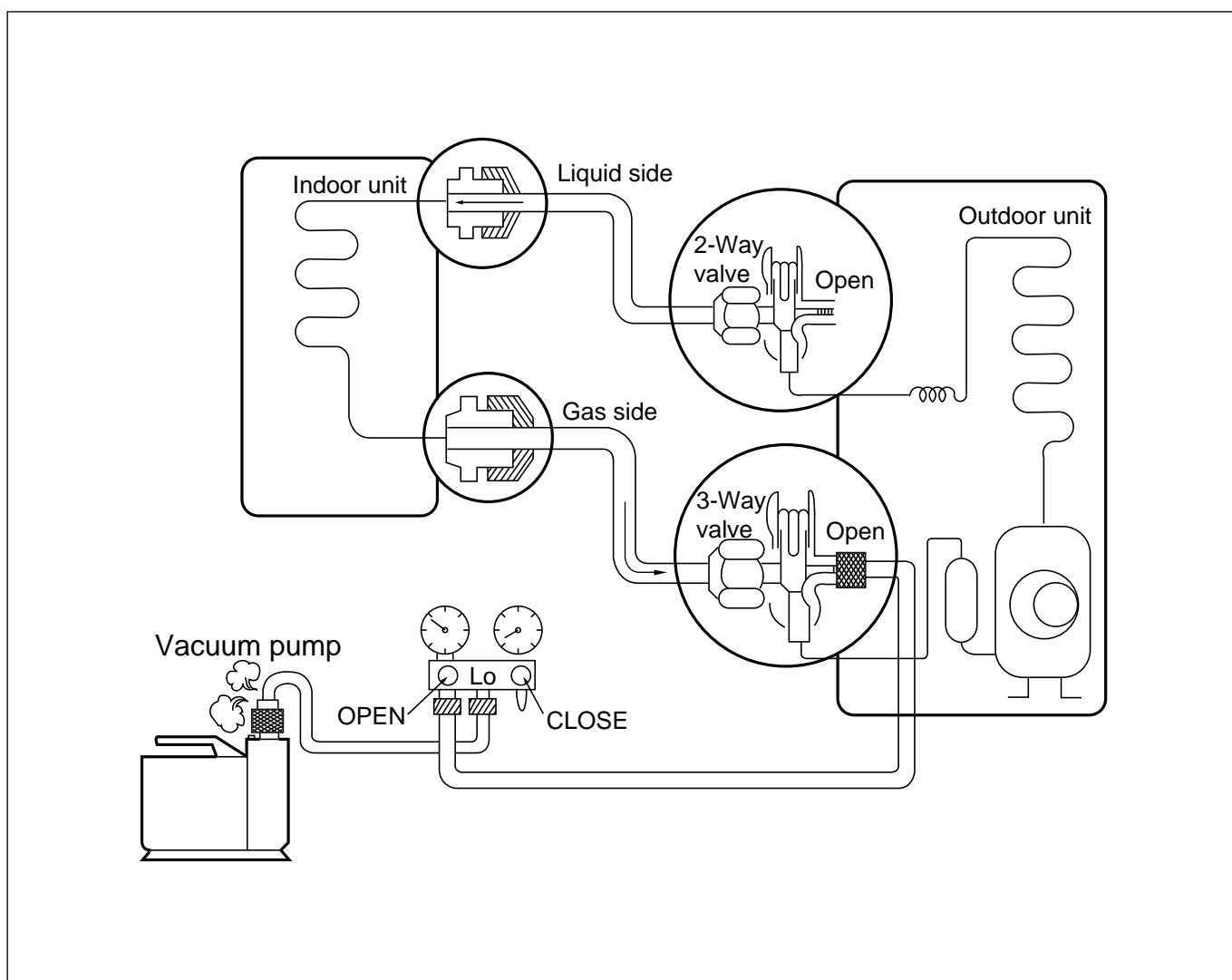
- Leave the valve on the charge set closed.
- Connect the charge hose to the service port.

(3) Open the valve (Lo side) on the charge set and discharge the refrigerant until the gauge indicates 0 kg/cm²G.

- If there is no air in the refrigerant cycle (the pressure when the air conditioner is not running is higher than 1 kg/cm²G), discharge the refrigerant until the gauge indicates 0.5 to 1 kg/cm²G. if this is the case, it will not be necessary to apply an evacuation.
- Discharge the refrigerant gradually; if it is discharged too suddenly, the refrigeration oil will also be discharged.

3. Evacuation

(All amount of refrigerant leaked)

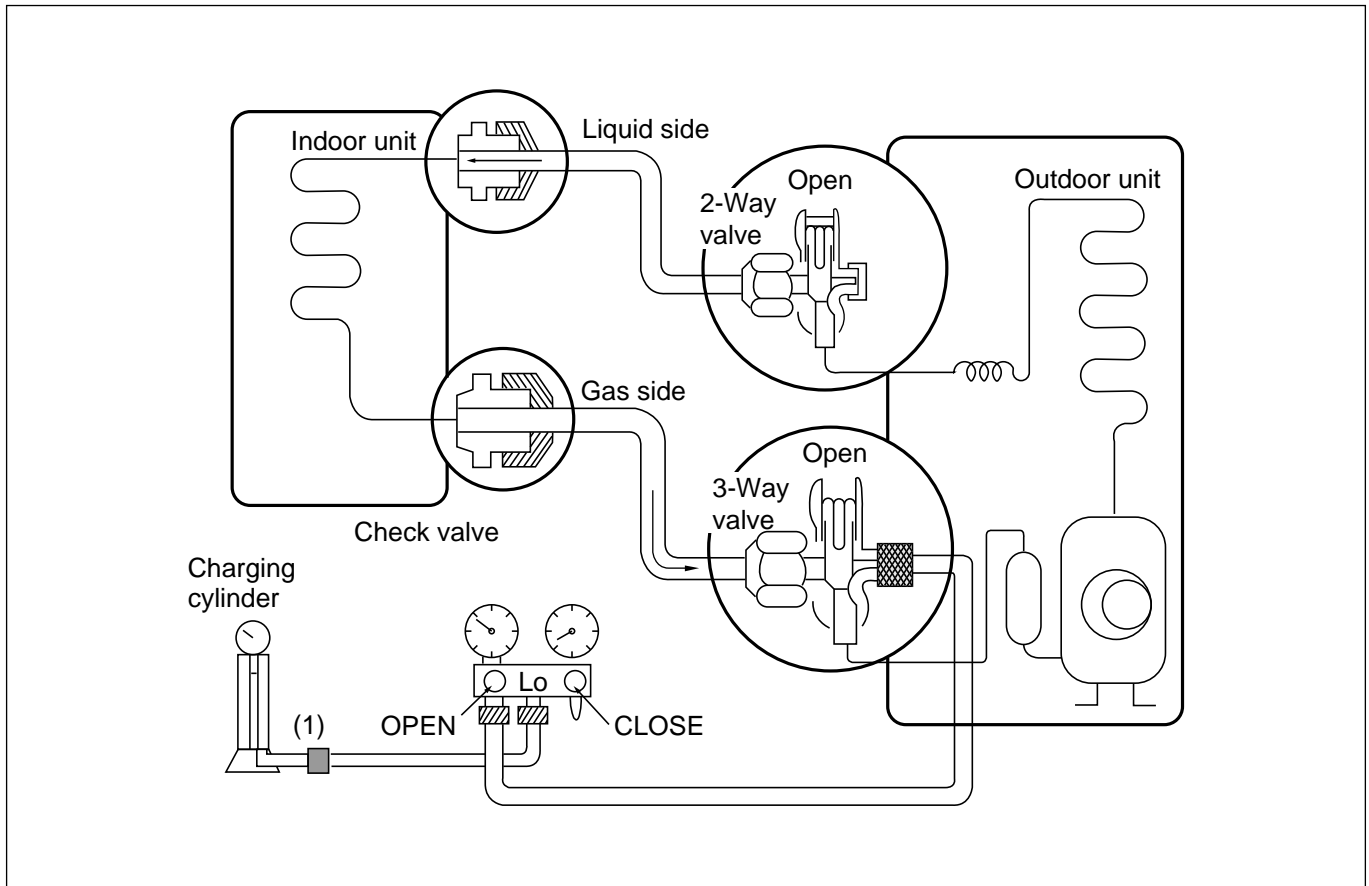


• Procedure

- (1) Connect the vacuum pump to the center hose of charge set center hose
- (2) Evacuation for approximately one hour.
 - Confirm that the gauge needle has moved toward -76cmHg (vacuum of 4 mmHg or less).
- (3) Close the valve (Lo side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
- (4) Disconnect the charge hose from the vacuum pump.
 - Vacuum pump oil.
 - If the vacuum pump oil becomes dirty or depleted, replenish as needed.

4. Gas Charging

(After Evacuation)



• Procedure

(1) Connect the charge hose to the charging cylinder.

- Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder.
- If you are using a gas cylinder, also use a scale and reverse the cylinder so that the system can be charged with liquid.

(2) Purge the air from the charge hose.

- Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air. (Be careful of the liquid refrigerant). The procedure is the same if using a gas cylinder.

(3) Open the valve (Lo side) on the charge set and charge the system with liquid refrigerant.

- If the system can not be charged with the specified amount of refrigerant, it can be charged with a little at a time (approximately 150g each time) while operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure (pumping down-pin).

This is different from previous procedures. Because you are charging with liquid refrigerant from the gas side, absolutely do not attempt to charge with larger amounts of liquid refrigerant while operating the air conditioner.

(4) Immediately disconnect the charge hose from the 3-way valve's service port.

- Stopping partway will allow the gas to be discharged.
- If the system has been charged with liquid refrigerant while operating the air conditioner turn off the air conditioner before disconnecting the hose.

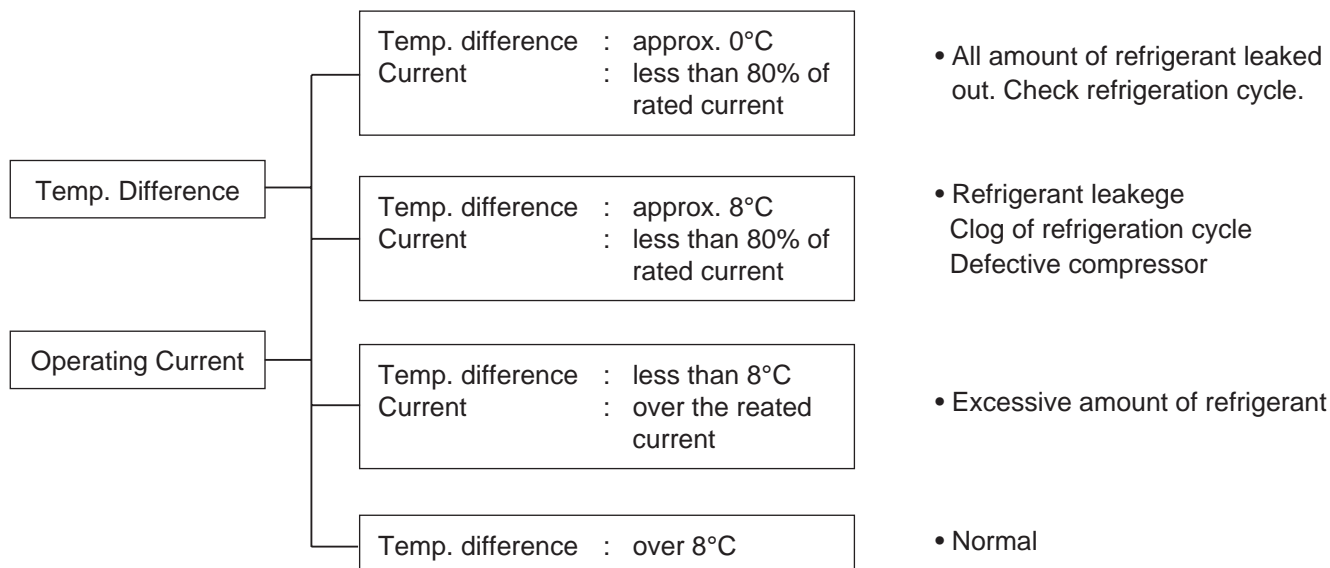
(5) Mount the valve stem nuts and the service port nut.

- Use torque wrench to tighten the service port nut to a torque of 1.8 kg.m.
- Be sure to check for gas leakage.

Cycle Troubleshooting Guide

Trouble analysis

1. Check temperature difference between intake and discharge air and operating current.



Notice :

Temperature difference between intake and discharge air depends on room air humidity. When the room air humidity is relatively higher, temperature difference is smaller. When the room air humidity is relatively lower temperature difference is larger.

2. Check temperature and pressure of refrigeration cycle.

Suction pressure (Compared with the normal value)	Temperature (Compared with the normal value)	Cause of Trouble	Description
Higher	High	Defective compressor Defective 4-way reverse valve	Current is low.
	Normal	Excessive amount of refrigerant	High pressure does not quickly rise at the beginning of operation.
Lower	Higher	Insufficient amount of refrigerant (Leakage) Clogging	Current is low. Current is low.

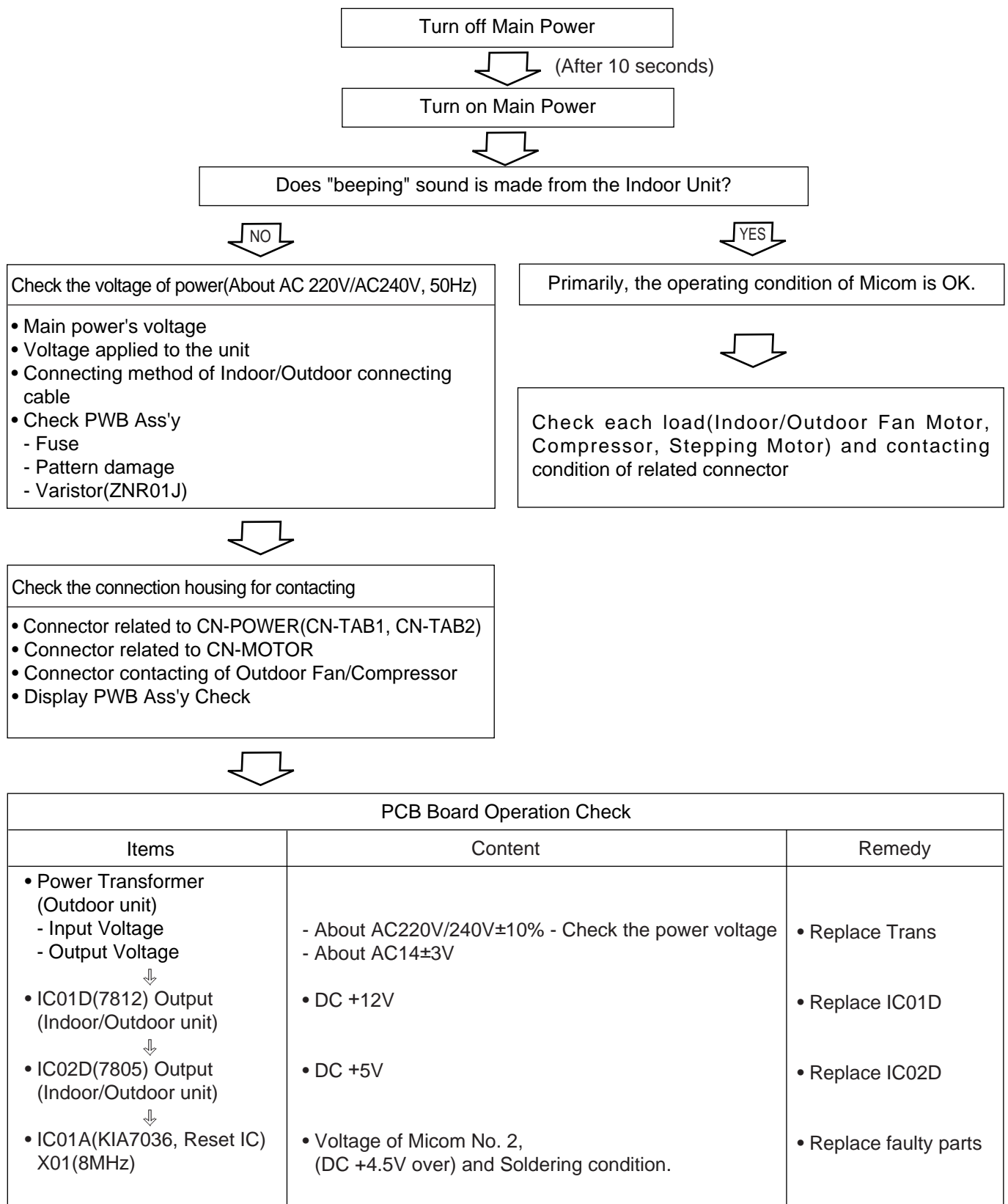
Notice :

1. The suction pressure is usually 4.5~6.0 kg/cm²G(Cooling) at normal condition.
2. The temperature can be measured by attaching the thermometer to the low pressure tubing and wrap it with putty.

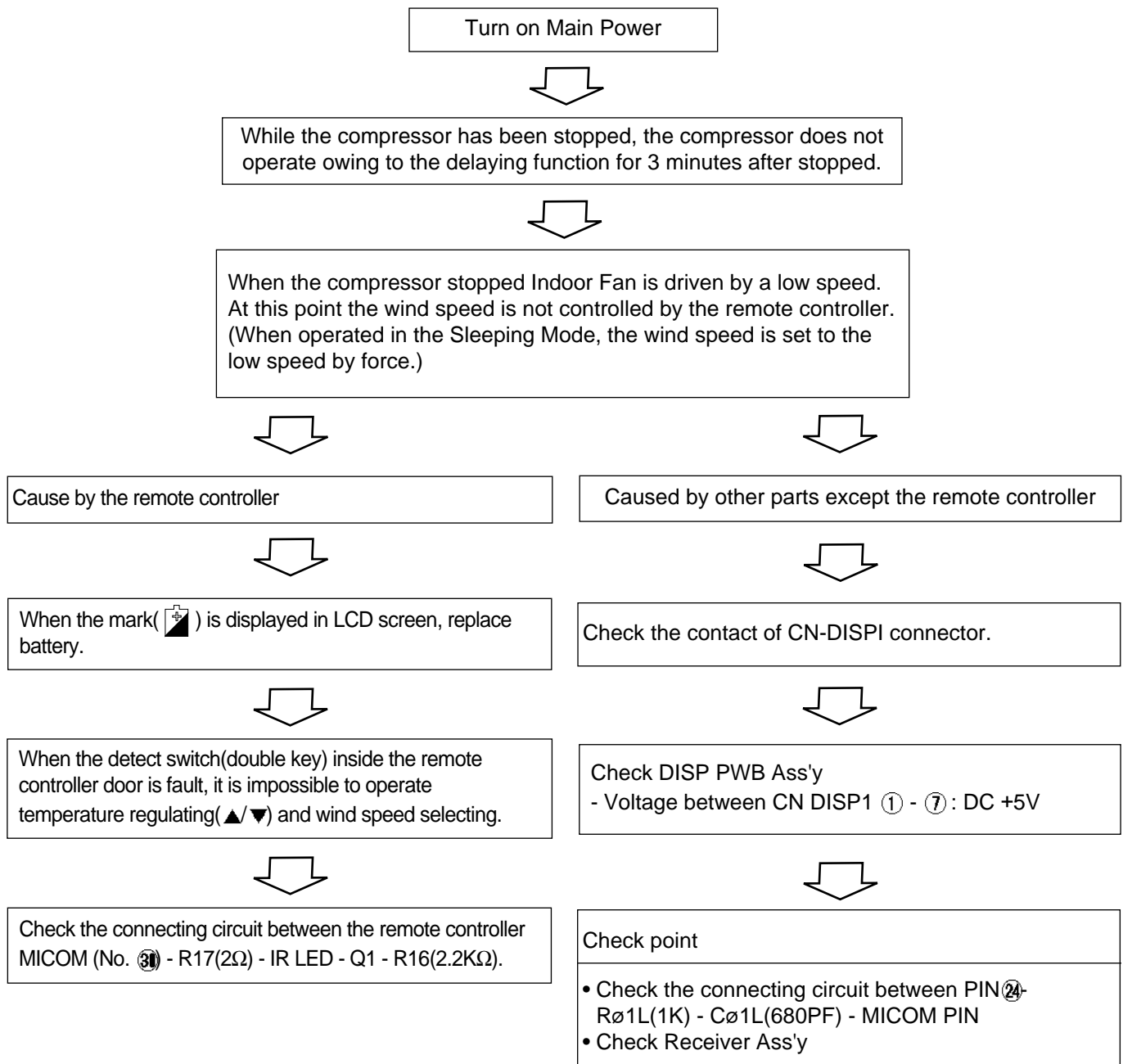
Electronic Parts Troubleshooting Guide

1. Product does not operate at all.

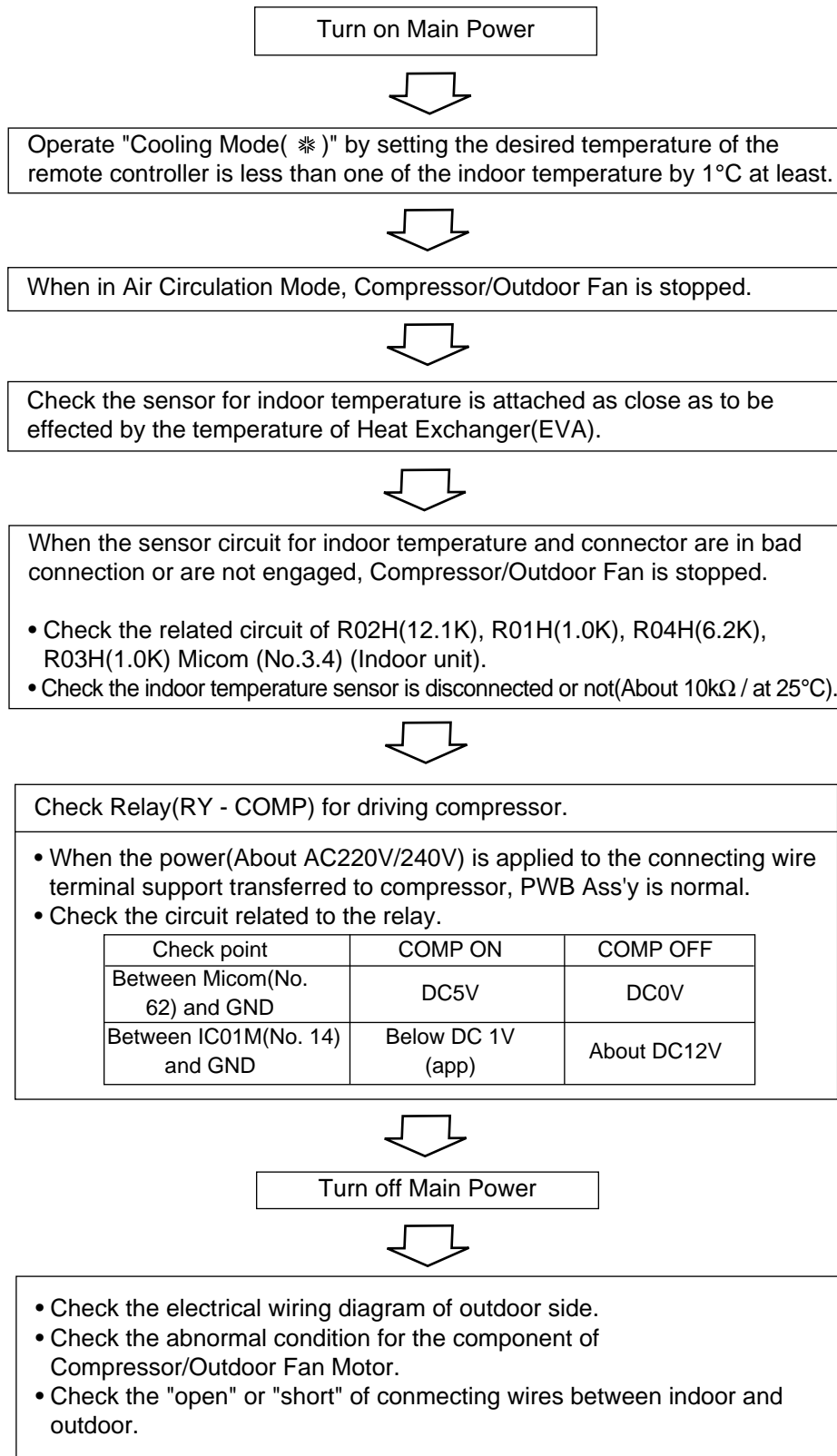
(* Refer to Electronic Control Device drawing and Schematic diagram.)



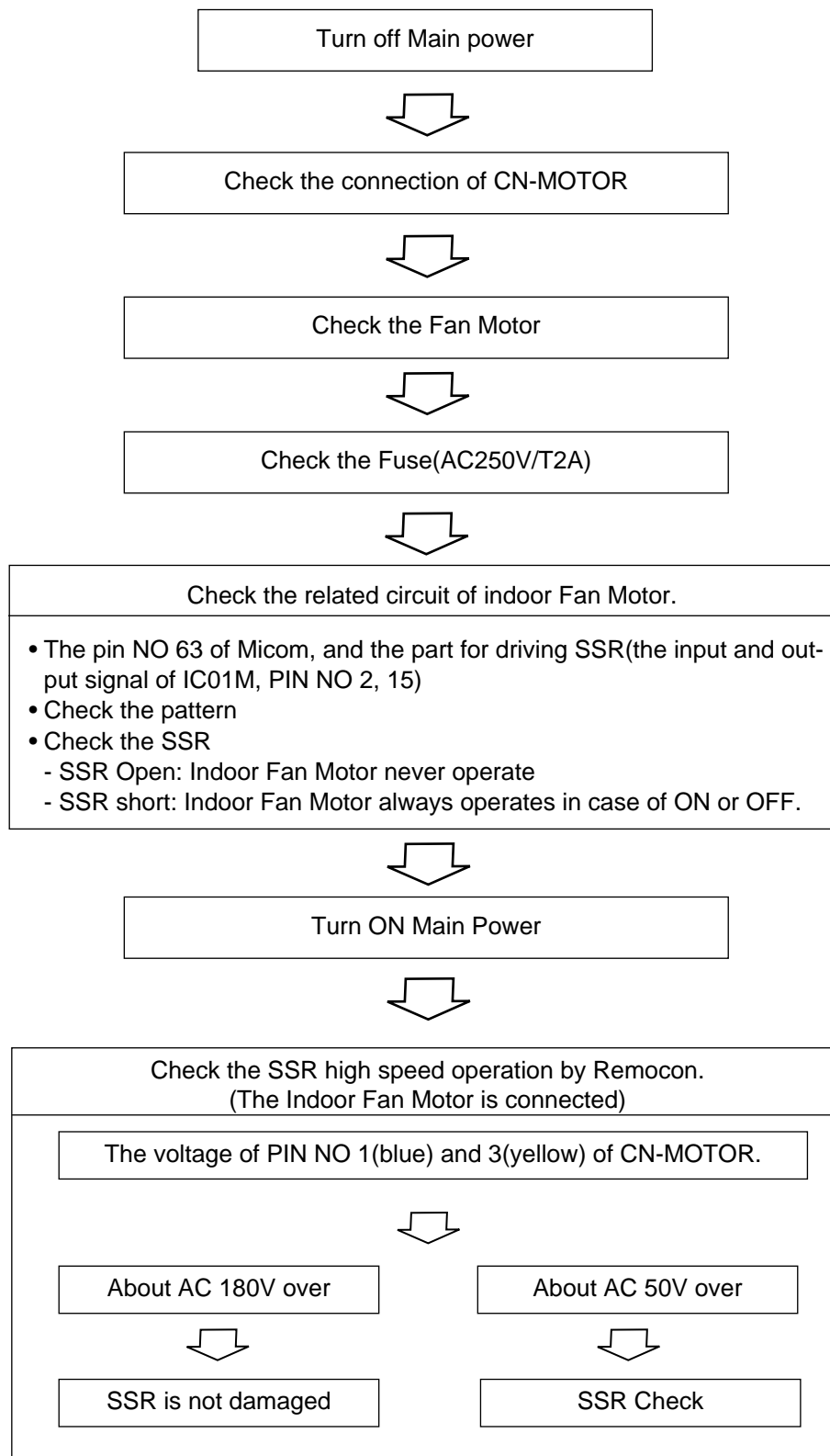
2. The product is not operate with the remote controller.



3. Compressor/Outdoor Fan are unable to drive.



4. When indoor Fan does not operate.



5. When Vertical Louver does not operate.

- Confirm that the Vertical Louver is normally geared with the shaft of Stepping Motor.
- If the regular torque is detected when rotating the Vertical Louver with hands ⇒ Normal



- Check the connecting condition of CN-U/D Connector
- Check the soldering condition(on PWB) of CN-U/D Connector



Check the operating circuit of the Vertical Louver

- Confirm that there is DC +12V between pin ①(RED) of CN-U/D and GND.
- Confirm that there is a soldering short at following terminals.
 - Between ⑤⑧, ⑤⑨, ⑥⑩ and ⑥⑪ of MICOM
 - Between ④, ⑤, ⑥ and ⑦ of IC01M
 - Between ⑩, ⑪, ⑫ and ⑬ of IC01M



If there are no problems after above checks

- Confirm the assembly conditions that are catching and interfering parts in the rotation radial of the Vertical Louver

6. When Heating does not operate

Turn ON Main Power



Operate "Heating Mode(☀)" by setting the desired temperature of the remote controller is higher than one of the indoor temperature by 2°C at least.



In heating Mode, the indoor fan operates in case the pipe temperature is higher than 28°C.



Check the connector of intake and pipe sensor(thermistors)

- Check the related circuit of R02H(12.1K), R01H(1.0K), R04H(6.2K), R03H(1.0K), Micom(No. 3, 4).
- Check the indoor room temperature is disconnected or not (about 10KΩ/at 25°C).
- Check the indoor pipe temperature is disconnected or not (about 5KΩ/at 25°C).



Check the DC voltage on the PWB ASS'Y

- The details of check are as followings

- Comp Relay.

Check point	Comp ON	Comp OFF
Between Micom (NO.62) and GND	DC 5V	DC 0V
Between IC01M (NO.14) and GND	Below DC 1V	About DC 12V

- Outdoor fan Relay

Check point	Fan ON	Fan OFF
Between Micom (NO.53) and GND	DC 5V	DC 0V
Between IC02M (NO.15) and GND	Below DC 1V	About DC 12V

- 4 way Relay

Check point	4 way ON	4 way OFF
Between Micom (NO.54) and GND	DC 5V	DC 0V
Between IC02M (NO.16) and GND	Below DC 1V	About DC 12V



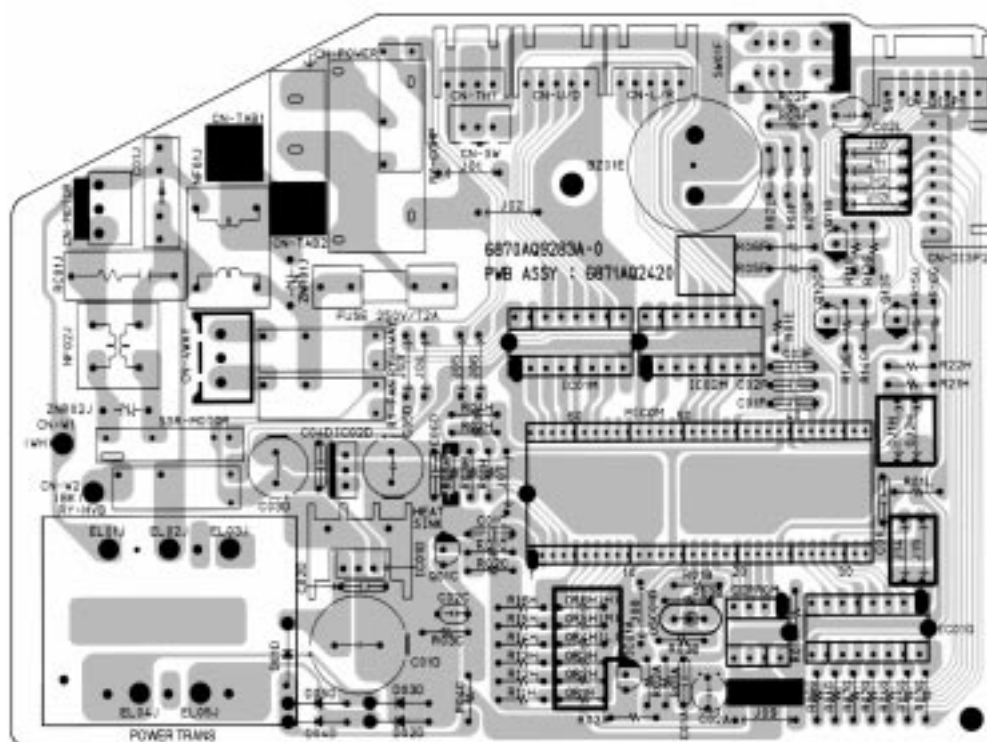
Turn off Main Power



- Check the electrical wiring diagram of outdoor side.
- Check the abnormal condition for the component of Compressor/Outdoor Fan Motor, 4 way.
- Check the "open" or "short" of connecting wires between indoor and outdoor.

Electronic Control Device

(1) MAIN P.C.B ASM

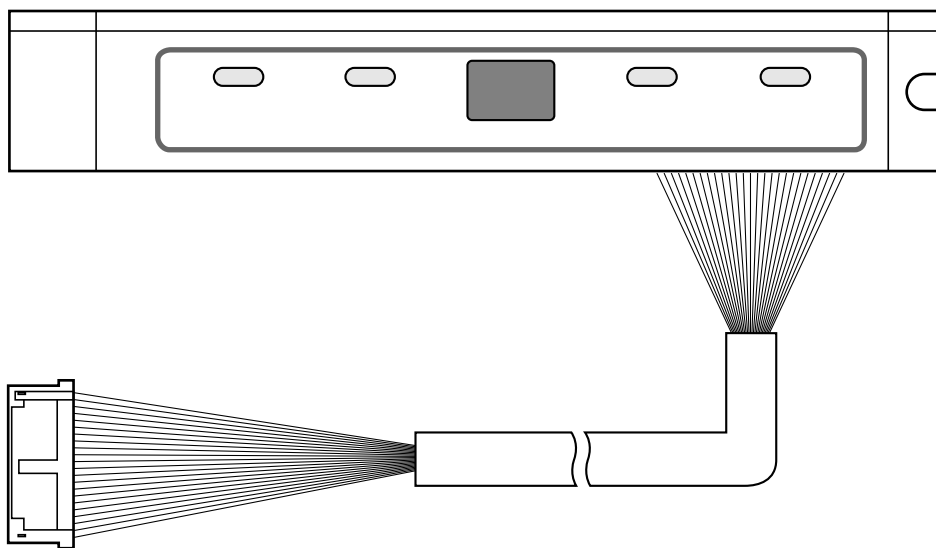


PCB ASS'Y SVC PART LIST

NO.	MODEL	P/NO	OPTIONAL FUNCTION					
			OR1H	OR2H	OR3H	OR4H	OR5H	OR6H
1	LS-K1820CL/CM	6871AQ2420Q	6.8K	OPEN	3K	56K	27K	20K
2	LS-K1820HL/HM	6871AQ2420P	91K	5.1K	3K	16K	27K	20K
3	LS-K1860CL/CM	6871AQ2420N	6.8K	OPEN	3K	15K	10K	20K
4	LS-K1860HL/HM	6871AQ2420M	91K	6.8K	3K	10K	5.11K	12K
5	LS-K1861CL/CM	6971A20035A	6.8K	OPEN	3K	15K	10K	20K
6	LS-K1861HL/HM	6871A20035B	91K	6.8K	3K	10K	5.1K	12K
7	LS-K2420CL/CM	6871AQ2420U	6.8K	OPEN	SHORT	20K	27K	20K
8	LS-K2420HL/HM	6871AQ2420T	91K	1K	SHORT	15K	27K	10K
9	LS-K2621CL/CM	6871A20035C	6.8K	OPEN	SHORT	20K	27K	20K
10	LS-K2621HL/HM	6871A20035D	91K	1K	SHORT	15K	27K	10K
11	LS-K2460CL/CM	6871AQ2420R	6.8K	OPEN	SHORT	6.8K	2K	SHORT
12	LS-K2460HL/HM	6871AQ2420S	91K	SHORT	SHORT	6.8K	2K	SHORT
13	LS-K2661CL/CM	6871A20035E	6.8K	OPEN	SHORT	6.8K	2K	SHORT
14	LS-K2661HL/HM	6871A20035F	91K	SHORT	SHORT	6.8K	2K	SHORT

(2) Display Ass'y

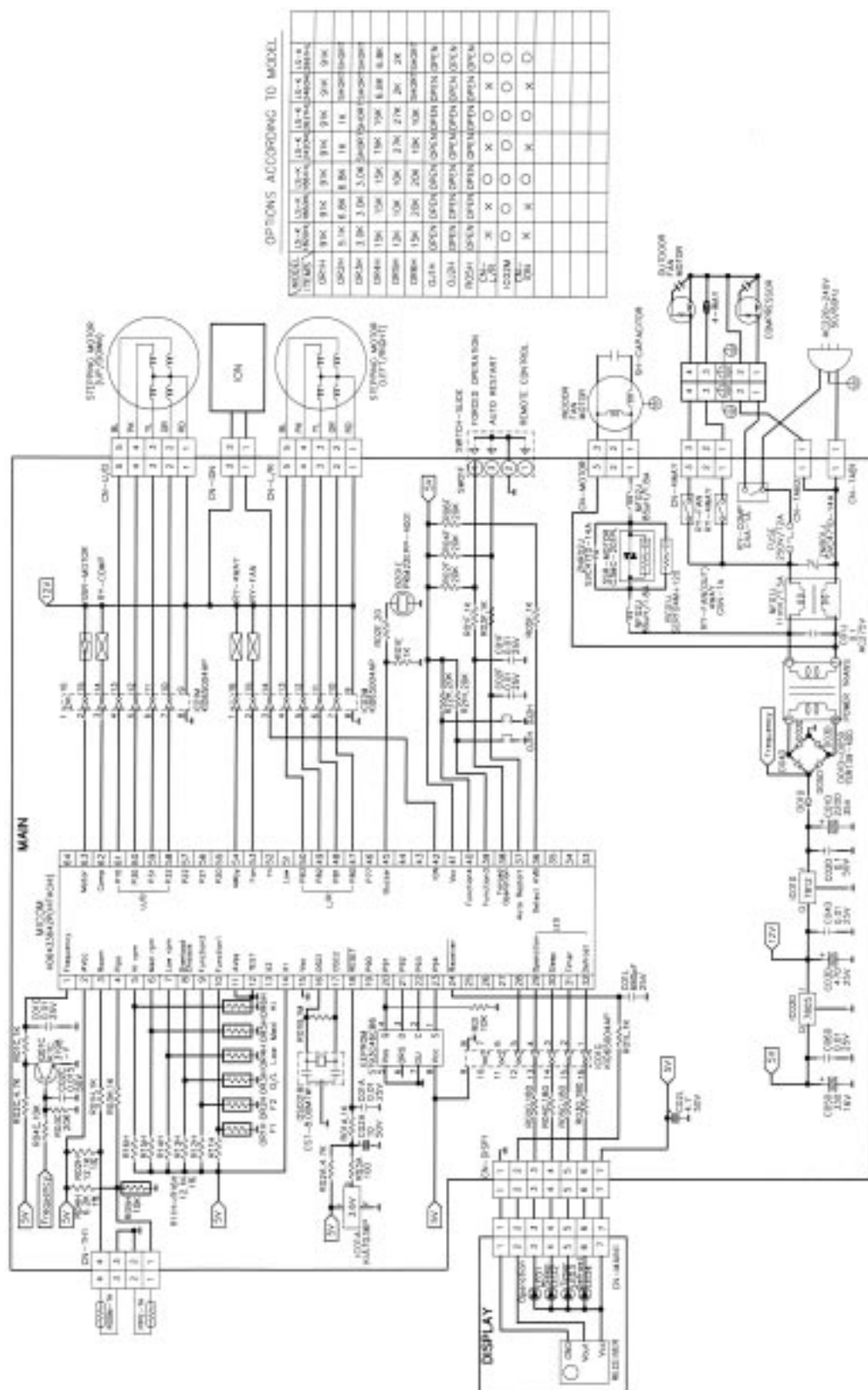
LS-K1820/1860/1861/2420/2460/2621/2661CL/CM/HL/HM



Cooling Only Series

[illegible]

Heat Pump Series



OPTIONS ACCORDING TO MODEL

[illegible]